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1956 Intersectional Contest———

EFFECT OF LATEX COMPOUNDS ON THE DYEING OF SPUN VISCOSE RAYON CARPETING WITH SELECTED FAST TO LIGHT DIRECT DYES*

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INTRODUCTION

DURING the rapid growth of the tufted textile industry in the Southeast for the past few years, one of the major problems that has confronted it has been the difficulty of maintaining shade uniformity and color fastness from dye lot to dye lot.

Tufted rayon carpet has been processed using twelve selected dyes, several of which contained copper, together with counterparts which were copper free. Four latex formulations were used—three compounded from natural latex and one compounded from GR-S. Latex was applied before and after dyeing.

Tests conducted were:

(1) Light Exposure (Fade-Ometer)
(2) AATCC Wash Test #2
(3) Oxygen Bomb Aging
(4) Air Oven Aging

Shade variations, together with significant latex deterioration, are evident.

The burden of responsibility for meeting or overcoming this problem has shifted back and forth chiefly between the latex backing formulators and dyestuff manufacturers with viscose rayon makers and yarn spinning plants bearing some responsibility. Many ideas for explaining and overcoming this problem have been advanced by carpet dyers and finishers as well as by the suppliers of latex compounds, dyestuffs, and

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tufting yarns.

To date, however, there has been no concerted scientific effort published to correlate these various ideas into a practical set of technical recommendations for the mill dyer and tufted carpet finishing plants.

With this need in mind, representatives of the tufted textile industry met with representatives of dyestuff manufacturers and latex compound manufacturers to enlist the support of the AATCC and the Tufted Textile Manufacturing Association (TTMA) towards initiating a coordinated study of the problem.

Recognizing this need, and at the request of the interested parties, the South Central Section has gladly made this the subject of its 1956 Intersectional Contest paper. Support from the TTMA is hereby gratefully acknowledged.

OBJECTIVES

Unexpected variations in dye shades have been encountered in the dyeing and finishing of tufted carpeting which has been backcoated with latex compounds. Such variations occur whether carpeting is dyed before or after latexing. Uniform dyeing is particularly difficult to obtain when latex formulations are changed and dye formulations are held constant.

It is known that dithiocarbamate type ultra accelerators are commonly used to speed the vulcanization of latex applied to tufted carpeting. The drying and curing period of the applied latex may vary from about three minutes to fifteen minutes at oven temperatures of from about 250 to 300°F.

The brown stain reaction of dithiocarbamates with copper is well known *(1, 2, 3)*. The direct dyes used by the tufted carpet industry are selected for their maximum fastness to light. Some of these dyes contain copper.

With these facts in mind, it was decided to evaluate shade control using latex containing no dithiocarbamate accelerator and latex containing dithiocarbamate accelerator in conjunction with copper-free and copper-containing direct dyes commonly used by the trade.

It was also decided to determine the effect of the selected dyes on the aging properties of the latex backing compounds used in this study.

Spun viscose rayon (desulfurized) tufted on light jute backing was selected as a representative fabric for our study. A detailed description of this fabric is given in Appendix A.

Four latex compounds were chosen, three formulated from natural rubber latex, the fourth from GR-S cold rubber latex. Three accelerators were used, as the antioxidant and other compounding ingredient were held constant, as follows:

Latex 1: Natural rubber latex incorporating zinc mercaptobenzothiazole accelerator (referred to hereafter as L-1).

Latex 2: Natural rubber latex incorporating sodium dibutyl dithiocarbamate accelerator (referred to hereafter as L-2).

Latex 3: Natural rubber latex incorporating zinc dibutyl dithiocarbamate accelerator (referred to hereafter as L-3).

Latex 4: GR-S latex incorporating zinc mercaptobenzothiazole accelerator (referred to hereafter as L-4).

Complete latex compound formulations are shown in Table I.

TABLE I

Latex formulations, dry active weights

	L-1	L-2	L-3	L-4
Natural latex	100.0	100.0	100.0	—
GR-S 2105 latex	—	—	—	100.0
Polyoxyethylated fatty alcohol	3.0	3.0	3.0	3.0
Zinc oxide	5.0	5.0	5.0	5.0
Sulfur	1.0	1.0	1.0	1.0
Zinc 2-mercaptobenzothiazole	2.0	—	—	2.0
Sodium dibutyl dithiocarbamate	—	2.0	—	—
Zinc dibutyl dithiocarbamate	—	—	2.0	—
Semireinforcing clay	100.0	100.0	100.0	100.0
4, 4′ Butylidenebis (6-tert-butyl m-cresol)	1.0	1.0	1.0	1.0
Potassium hydroxide	0.1	0.1	0.1	0.1
Sodium polyacrylate	0.7	0.7	0.7	0.45
Sodium salt of carboxylated polyelectrolyte	1.0	1.0	1.0	1.0
Solids content %	56.11	56.17	55.51	56.02
pH	10.6	10.5	10.6	10.5
Viscosity cps, Brookfield	1500	1470	1520	1470

TABLE II

List of selected direct dyestuffs used

No.	Dyestuff	Pr No.	Content Cu*	Content Mn*
1	Brown BRL	47	4–4½%	.004%
2	Fast Brown AL	566	free	
3	Fast Blue Green BL	470	free	
4	Dark Green GBL	—	1.7%	.001%
5	Fast Gray LVL	—	2.5%	
6	Fast Orange EG	72	free	
7	Fast Red 6 BLL	428	free	
8	Blue SGKS	432	5.5%	
9	Blue LBRRA	71	free	
10	Yellow FFGL	—	free	
11	Fast Red 3BL	491	3.3%	
12	Fast Grey B	—	free	

*Copper and manganese content figures supplied by dye manufacturers.

Twelve direct dyes were selected. Seven were copper-free, five contained copper (see Table II).

PROCEDURES

The carpeting was scoured and dyed by standard methods. Part of the scoured fabric was dyed with each of the twelve dyes before latex was applied. Portions of the balance of the scoured fabric were coated with each of the four latex compounds and then dyed with each of the twelve selected dyes.

Latex was applied to the tufted fabric on a roller coater to the extent of 22 ounces dry compound per square yard of fabric, then dried under infra-red lights for four minutes. All coated fabric was then cured an additional sixteen minutes in a hot air oven at 280° F. Fabrics coated with L-1 and L-4 were subjected to an additional curing time of twenty-five minutes at 280° F.

Scouring and dyeing procedures are specified in Appendix B.

TEST METHODS

1) Standard #2 AATCC Wash Test using Launder-Ometer conducted at 120° F using 0.5% soap for a 30-minute period.
2) Light exposure in Fade-Ometer for 10, 20 and 40 standard hours, face and back exposures.
3) Oxygen bomb aging for 72 hours at 300 psi and 170° F.
4) Circulating air oven aging for 100, 200 and 300 hours at 212° F.

RESULTS OF TESTS

The results of all tests are shown in tabular form in Table III.

Method of rating wash test fastness, light fastness, and extent of degradation of rubber backings are given in Appendix C.

CONCLUSIONS

1) Appreciable shade variations were caused by latex formulations containing dithiocarbamate (L-2 and L-3) in conjunction with dyes containing copper.
2) Latex formulations L-1 and L-4 containing no dithiocarbamate caused little or no shade variations on any of the twelve dyes selected. Both L-1 and L-4 latex were exceedingly slow in curing, requiring in excess of 40 minutes at 280° F to complete vulcanization. This slow rate of cure is, of course, unacceptable for production reasons.
3) There was little adverse effect on light fastness of the shade caused

DYED AFTER LATEXING | DYED BEFORE LATEXING | DYED AFTER LATEXING | DYED BEFORE LATEXING | DYED AFTER LATEXING | DYED BEFORE LATEXING | DYED AFTER LATEXING | DYED BEFORE LATEXING

TABLE III

Test Results

			AATCC WASH TEST #2			40 HR FADE-OMETER EXPOSURE				OXYGEN BOMB TEST		OVEN AGING		
						Dyeing		Backing		Latex Backing				
			SC	Str	Stain	SC	Str	Discol	Degr	Discol	Degr	Hrs @ 212° F	Disc	Degr
Dye No. 1 (Brown BRL)														
DYED BEFORE LATEXING	No latex		N	4–3	2	N	5+							
	L-1		N	4–3	2	N	5+	3	2	N	5	100	4	4
												200	4	3T
												300	3–4	2–1B
	L-2		3Y	3	2–3	N	5+	3–4	3	N	4	100	5	4
												200	5	4
												300	5	2–1B
	L-3		3Y	3	2–3	N	5+	4	3–4	N	5	100	5	4
												200	5	4
												300	5	2B
	L-4		N	4–3	2	N	5+	4–5	3–4	N	5	100	4	5
												200	4	4
												300	3–4	4
DYED AFTER LATEXING		Shade vs No Latex												
	L-1	4–3Y	N	4	2	N	5+	2	2–3	3	4	100	4	3T
												200	4	2B
												300	3	2–1B
	L-2	2–3R	N	4–3	2	N	5+	2–3	2–3	3	3	100	4	4
												200	4	4
												300	4	3T
	L-3	N	N	2	2	N	5+	2–3	2–3	2–3	4	100	4	4
												200	4	4
												300	4	2B
	L-4	N	N	3	2–3	N	5+	4	2–3	3–4	4	100	4–5	4–5
												200	4	4–5
												300	3	2–3B
Dye No. 2 (Brown AL)														
DYED BEFORE LATEXING	No Latex		N	3	2–3	N	5+							
	L-1		N	3	2–3	N	5+	2	3B	5	5	100	4	5
												200	3–4	4T
												300	3	2B
	L-2		N	2–3	2–3	N	5+	2	3B	5	5	100	5–4	5
												200	4	5
												300	4	5
	L-3		N	2–3	2–3	N	5+	3	3–4B	5	5	100	5	5
												200	5–4	5
												300	4–3	3T
	L-4		N	3	2–3	N	5+	4	4	5	5	100	5–4	5
												200	4	5
												300	4	5
DYED AFTER LATEXING		Shade vs No Latex												
	L-1	3Y	4R	4	3	N	5+	2–3	3B	5	5–4T	100	5–4	3T
												200	4	2T
												300	4	1B
	L-2	3Y	N	3	3–4	N	5+	2–3	3–4	5	5	100	5–4	5
												200	4	5
												300	4	3T
	L-3	N	N	2–3	2–3	N	5+	2–3	3–4	5	5	100	5–4	5
												200	5–4	5
												300	4–3	4T
	L-4	N	N	4–5	3–4	N	5+	4	3–4	5	5	100	5–4	5
												200	4	5
												300	4	5
Dye No. 3 (Fast Blue Green BL)														
DYED BEFORE LATEXING	No Latex		N	3	4	N	5+							
	L-1		N	3	4	N	5+	2	2–3B	4	4	100	4	3T
												200	3	3T
												300	3	2B
	L-2		3Y	3	4	N	5+	3	3B	4–5	4–5	100	5	5
												200	5–4	5
												300	5–4	5
	L-3		4Y	3	4–5	N	5+	3	3B	4–5	5	100	5	5
												200	5	5
												300	4	4–5
	L-4		N	3	4	N	5+	4	3B	4–5	5	100	4	4
												200	4–3	4–3B
												300	3	3B
DYED AFTER LATEXING		Shade vs No Latex												
	L-1	N	N	3–4	4–5	N	5+	3	2B	4	4	100	4–5	3T
												200	3–4	2T
												300	2	1B
	L-2	N	N	3–4	4–5	N	5+	3	3B	5	5	100	5	5
												200	5	5
												300	4	4
	L-3	N	N	3–4	4–5	N	5+	4	2–3B	4–5	5	100	4–5	5
												200	4–5	5
												300	4	4–5
	L-4	N	N	3–4	4–5	N	5+	4	3B	5	5	100	5	5
												200	5–4	5
												300	5–4	5

TABLE III (continued)

			AATCC WASH TEST #2			40 HR FADE-OMETER EXPOSURE				OXYGEN BOMB TEST		OVEN AGING		
						Dyeing		Backing		Latex Backing				
			SC	Str	Stain	SC	Str	Discol	Degr	Discol	Degr	Hrs @ 212° F	Disc	Degr
Dye No. 4 (Green GBL)														
DYED BEFORE LATEXING	No Latex		N	4–5	3–4	N	5+							
	L-1		N	4–5	3–4	N	5	2	2B	4–5	5	100	4	4T
												200	3–4	3–4T
												300	2	1B
	L-2		1-Y	3	4	N	5	3	2–3B	5	5	100	4–5	5
												200	4–5	5
												300	4	3–4T
	L-3		3-Y	3–4	4–5	N	5	3–4	2–3B	5	5	100	4	5
												200	4	5
												300	2	1B
	L-4		N	4	3–4	N	5	4	2–3B	5	5	100	4–5	5
												200	4	5
												300	3–4	5
DYED AFTER LATEXING		Shade vs No Latex												
	L-1	N	N	3–4	4–5	N	5	2–3	2B	5	3–4T	100	4	2T
												200	3	2B
												300	2	1B
	L-2	1-BL R	1-Y	2–3	4–5	3-D	3–4	3	3B	5	5	100	5	5
												200	5	5
												300	4	3T
	L-3	1-BL	2-Y	3	4–5	3-D	4	4	3B	5	5	100	5	5
												200	5	5
												300	2	1B
	L-4	N	N	3	3–4	N	5	4	3B	5	5	100	5	5
												200	5	5
												300	3–4	4
Dye No. 5 (Gray LVL)														
DYED BEFORE LATEXING	No Latex		N	3	3–4	N	5+							
	L-1		N	3	3–4	N	5+	2	2B	5	5	100	5	5
												200	4–5	3T
												300	3–4	1B
	L-2		1-Y-D	2	4–5	N	5+	2–3	3B	5	5	100	5	5
												200	4–5	4B
												300	3	1B
	L-3		1-Y-D	3	4–5	N	5+	2–3	3–4B	5	5	100	4–5	5
												200	4	3B
												300	3	1B
	L-4		N	3	3–4	N	5+	3	4	5	5	100	4–5	5
												200	4	4–5
												300	3–4	4B
DYED AFTER LATEXING		Shade vs No Latex												
	L-1	N	N	3–4	3–4	N	5+	3	2D	5	5	100	4–5	3T
												200	4	2T
												300	2	1B
	L-2	N	1-Y-D	3	4–5	N	5+	3	3–4B	5	5	100	4–5	5
												200	4	5
												300	4	2–3B
	L-3	N	1-Y-D	3	4–5	N	5+	4	3–4B	5	5	100	5	5
												200	4–5	5
												300	3–4	1B
	L-4	N	N	2	3–4	N	5+	4	3B	5	5	100	5	5
												200	4–5	5
												300	3–4	2B
Dye No. 6 (Orange EG)														
DYED BEFORE LATEXING	No Latex		N	4	3	3-R	4							
	L-1		N	4	3–4	3-R	4	2–3	3B	5	5	100	4–5	5
												200	4–5	5
												300	4	2B
	L-2		N	4	3–4	3-R	4	3–4	3B	4	5	100	4	5
												200	4	4B
												300	4	4–5
	L-3		N	3–4	4	3-R	4	3–4	3B	5	5	100	4–5	5
												200	4–5	5
												300	4	3B
	L-4		N	4	3–4	3-R	4	4	4B	5	5	100	4–5	4B
												200	4	4B
												300	4	3–4B
DYED AFTER LATEXING		Shade vs No Latex												
	L-1	N	N	5	3–4	2-R	4	3	3–4B	5	4–5T	100	4–5	4T
												200	4–5	2T
												300	3	1B
	L-2	N	N	5	3–4	3-R	4	3–4	4B	5	5	100	5	5
												200	4–5	5
												300	4–5	4–5
	L-3	N	N	5	3–4	3-R	4	3–4	3–4B	5	5	100	5	5
												200	5	5
												300	4	4B
	L-4	N	N	5	3–4	4-R	4	4–5	3–4B	5	5	100	4–5	5
												200	4–5	4B
												300	4	4B

TABLE III (continued)

			AATCC WASH TEST #2			40 HR FADE-OMETER EXPOSURE				OXYGEN BOMB TEST		OVEN AGING		
						Dyeing		Backing		Latex Backing				
			SC	Str	Stain	SC	Str	Discol	Degr	Discol	Degr	Hrs @ 212° F	Disc	Degr
Dye No. 7 (Fast Red 6BLL)														
DYED BEFORE LATEXING	No Latex		N	3–4	2–3	N	5+							
	L-1		N	3–4	2–3	N	5+	2	4	5	5	100	4	4T
												200	3–4	3T
												300	3	2B
	L-2		N	3–4	2–3	N	5+	3–4	4	5	5	100	5	5
												200	4–5	5
												300	4–5	4T
	L-3		N	3–4	2–3	N	5+	3–4	4	5	5	100	4–5	5
												200	4–5	5
												300	3	4T
	L-4		N	3–4	2–3	N	5+	4	4–5	5	5	100	4–5	5
												200	4	4–5
												300	4	4–5
DYED AFTER LATEXING		Shade vs No Latex												
	L-1	N	4-Y-B	4	2–3	N	5+	3–4	4	5	5	100	4–5	4T
												200	3	2T
												300	2–3	1B
	L-2	N	3-Y-B	5	3	N	5+	4	4	5	5	100	4–5	5
												200	4–5	5
												300	4	4T
	L-3	N	3-Y B	5	3	N	5+	4	4	5	5	100	4–5	5
												200	4–5	5
												300	4	4T
	L-4	N	3-Y B	5	3	N	5+	4–5	4–5	5	5	100	4–5	5
												200	4	5
												300	4	5
Dye No. 8 (Blue SGKS)														
DYED BEFORE LATEXING	No Latex		N	3	3	N	5+							
	L-1		N	3	3	N	5+	2	3B	5	5	100	4–5	4–5
												200	4	4T
												300	3	1B
	L-2		1-YD	2–3	4–5	N	5+	3	3–4B	5	5	100	4–5	5
												200	4–5	5
												300	3	2B
	L-3		1-YD	2–3	4–5	N	5+	3–4	3–4B	5	5	100	4–5	5
												200	4–5	5
												300	3	1B
	L-4		N	3	4–5	N	5+	4	3B	5	5	100	4–5	5
												200	4	5
												300	3–4	4–5
DYED AFTER LATEXING		Shade vs No Latex												
	L-1	N	N	4–5	4	N	5+	3–4	3B	4–5	5	100	4–5	3T
												200	3	2B
												300	2	1B
	L-2	4-R	2-Y	3	5	N	5+	4	4	5	5	100	5	5
												200	5	5
												300	5	4T
	L-3	N	2-Y	3	5	N	5+	4	3–4B	5	5	100	5	5
												200	5	5
												300	2	1B
	L-4	N	N	3	4–5	N	5+	4–5	3–4B	5	5	100	4–5	5
												200	4–5	5
												300	4	3B
Dye No. 9 (Blue LBRRA)														
DYED BEFORE LATEXING	No Latex		N	3–4	3	N	5+							
	L-1		N	3–4	3	4–5R	5+	2	2–3B	5	5	100	4	5
												200	3–4	3T
												300	3	1B
	L-2		N	3–4	3	N	5+	3	3B	5	5	100	4–5	5
												200	4	5
												300	4	5
	L-3		N	3–4	3	N	5+	3–4	3B	5	5	100	4–5	5
												200	4	5
												300	3–4	4B
	L-4		N	3–4	3	N	5+	4	3B	5	5	100	4–5	5
												200	4	5
												300	3–4	4B
DYED AFTER LATEXING		Shade vs No Latex												
	L-1	N	N	4	4	N	5+	3	3B	4–5	5	100	4–5	3T
												200	4	2T
												300	2	1B
	L-2	N	4-YB	4	4	N	5+	3–4	3B	5	5	100	4–5	5
												200	4–5	5
												300	4	4T
	L-3	N	N	3–4	4–5	N	5+	3–4	3B	5	5	100	4–5	5
												200	4–5	5
												300	4	3B
	L-4	N	N	5	4–5	N	5+	4–5	3–4B	5	5	100	4–5	5
												200	4	5
												300	4	4–5

TABLE III (concluded)

			AATCC WASH TEST #2			40 HR FADE-OMETER EXPOSURE				OXYGEN BOMB TEST		OVEN AGING		
						Dyeing		Backing		Latex Backing				
			SC	Str	Stain	SC	Str	Discol	Degr	Discol	Degr	Hrs @ 212° F	Disc	Degr
Dye No. 10 (Yellow FFGL)														
DYED BEFORE LATEXING	No Latex		N	4	3–4	N	5+							
	L-1		N	4	3–4	N	5+	2	2B	5	5	100	4	3T
												200	3–4	2T
												300	3	2B
	L-2		N	4	3–4	N	5+	3	3B	4–5	5	100	4–5	5
												200	4–5	5
												300	4	4
	L-3		N	4	3–4	N	5+	4	3B	5	5	100	5	5
												200	4–5	5
												300	4	4
	L-4		N	4	3–4	N	5+	4–5	3–4B	5	5	100	4	5
												200	3–4	4–5
												300	3	4
DYED AFTER LATEXING		Shade vs No Latex												
	L-1	N	4–5R	5	3–4	N	5+	3	2–3B	5	4T	100	4	3T
												200	4	2T
												300	2	1B
	L-2	N	3-R	5	3–4	N	5+	4	3B	5	5	100	4–5	5
												200	4–5	5
												300	4	4–5
	L-3	N	3-R	5	3–4	N	5+	4–5	4	5	5	100	5	5
												200	5–4	5
												300	4	4
	L-4	N	3-4R	4–5	3–4	N	5+	5	4–5	5	5	100	5	5
												200	5	5
												300	4–5	5
Dye No. 11 (Fast Red 3BL)														
DYED BEFORE LATEXING	No Latex		N	4	3–4	N	5+							
	L-1		N	4	3–4	N	5+	2	3	4–5	5	100	4–5	5
												200	4	4
												300	2	1B
	L-2		1-YD	2–3	4–5	N	5+	2–3	3–4	5	5	100	4–5	5
												200	4–5	5
												300	3	1–2B
	L-3		1-YD	2–3	4–5	N	5+	2–3	3–4	5	5	100	5–4	5
												200	4	4
												300	2	1B
	L-4		N	4	3–4	N	5+	3–4	3–4	5	5	100	4	5
												200	3	4
												300	2	3B
DYED AFTER LATEXING		Shade vs No Latex												
	L-1	N	N	3–4	3	N	5+	4	4	5	5	100	4	3T
												200	3	2B
												300	2	1B
	L-2	1-YD	1-YD	2	4–5	N	5+	3–4	4	5	5	100	5	5
												200	4–5	5
												300	4–5	1B
	L-3	4-YD	1-D	2	4	N	5+	4	5	4–5	5	100	5	5
												200	5	5
												300	3	1B
	L-4	N	N	3–4	3	N	5+	4–5	5	5	5	100	4–5	5
												200	4	5
												300	2	4B
Dye No. 12 (Fast Grey B)														
DYED BEFORE LATEXING	No Latex		N	3	4–5	3-RD	3–4							
	L-1		N	3	4–5	3-RD	4	2	3B	4–5	5	100	4	4T
												200	4	3T
												300	3	1–2B
	L-2		4-Y	2–3	4–5	3-RD	4	3	3B	5	5	100	4	5
												200	3–4	5
												300	3–4	4–5
	L-3		4-Y	2–3	4–5	3-RD	4	3	3B	5	5	100	5	5
												200	4	5
												300	3–4	3B
	L-4		N	3	4–5	3-RD	4	4	4B	5–4	5	100	5	5
												200	4	5
												300	3–4	4-B
DYED AFTER LATEXING		Shade vs No Latex												
	L-1	N	N	4	4–5	3–4R	4	2–3	2–3B	5	4T	100	4–5	3T
												200	4	2T
												300	2	1B
	L-2	4-YD	4-B	3	4–5	3–4R	4	3–4	3–4B	4	5	100	4	5
												200	4	5
												300	3–4	4T
	L-3	N	N	3–4	4–5	3–4R	4	3–4	3–4B	5	5	100	5–4	5
												200	5–4	5
												300	2–3	1–2B
	L-4	N	N	4	4–5	3–4R	4	4	4B	5	4	100	4–5	5
												200	4	5
												300	4	4–B

by any of the latex compounds, whether applied before or after dyeing.

4) The results of the wash fastness test indicate severe shade changes of dyes containing copper used in conjunction with Latex L-2 and L-3. Latex L-1 and L-4 showed little shade variations.

5) Shade control and washfastness are affected to a greater degree when the latex compounds are applied after dyeing. Probable causes are:

a) High temperature encountered by the dyed fiber during vulcanization of the latex.

b) Migration by capillary action of soluble constituents of the latex into the dyed fiber.

c) Absence of rinsing action encountered when latexed carpeting is dyed and which tends to remove objectionable water solubles.

6) Aging characteristics of all natural rubber latex compounds was adversely affected by copper-containing dyes. L-4 made with GR-S generally suffered less degradation. Air oven aging of latices L-1, L-2, and L-3 made with natural rubber exhibited a tendency first to become tacky, then to resinify when used in conjunction with copper dyes. Less deterioration was encountered when these latices were used in conjunction with noncopper dyes.

SUMMARY

Practical test methods have been demonstrated which will predict the effect on shade control of latex compounds with selected dyes on viscose carpeting.

Caution is recommended in the selection of copper-containing dyes used in conjunction with latex-containing dithiocarbamate accelerators.

These results indicate the need for further work towards the development of rapid curing accelerators which will give the quality of results encountered with latex formulation L-4.

APPENDIX A

Tufted carpeting used was constructed as follows:

Backing: Light, nonstaining jute.
Yarn: 2/2 spun viscose rayon, desulfurized, 50/50 blend of 15 denier dull and 8 denier bright.
Construction: 5/32" gauge, 7 stitches per inch, cut pile having ½" pile height.

APPENDIX B

SCOURING PROCEDURE FOR CARPETING:

Stainless-steel beck used.

1) 30:1 bath ratio. Chemicals used on weight of fabric (owf) were:
0.75% nonionic detergent
1.0% tetrasodiumpyrophosphate

2) Scouring bath started at 110° F, raised to 200° F in 30 minutes. Ran 20 minutes at 200° F.

3) Bath dropped, rinsed at 120° F for 10 minutes.

4) Bath dropped, fresh water added at 90° F containing 56% acetic acid. pH adjusted to 6.0.

5) Dropped, pulled and dried.

DYEING PROCEDURE FOR BOTH LATEXED AND NONLATEX CARPETING:

Nonlatexed carpet samples: 25′ x 1½′. Ran 0.4% dyestuff shade.
Latexed carpet samples: Four 4′ x 1½′ pieces for each dyestuff on list. Ran 0.34% dyestuff shade.

1) 30:1 dyebath ratio used, stainless steel beck. Water 110° F. 0.5% nonionic detergent added. Goods were run 5 minutes at 110° F.

2) Temperature raised to 200° F in 30 minutes—3° F rise per minute. Goods were run 10 minutes at 200° F.

3) 8% Common salt added while temperature was maintained at 200° F as follows:

1% salt, ran 5 min
2% salt, ran 5 min
2% salt, ran 5 min
3% salt, ran 15 min

Total 8% salt owf

4) Steam cut off, started cooling by washing over until bath was clear. Bath dropped at 90° F.

5) Fresh bath added, pH adjusted to 6.0-6.5 with acetic acid, rinsed 5 minutes, then dropped, extracted and dried.

APPENDIX C

WASH TEST RATINGS, STANDARD AATCC RATINGS:

Staining

5—Unstained
4—Slight Stain
3—Moderate Stain
2—Considerable Stain
1—Severe Stain

Shade Effect

5—Unaltered
4—Slightly Altered
3—Moderately Altered
2—Considerably Altered
1—Severely Altered

LIGHT FASTNESS RATINGS:

Standard AATCC rating scale except 5+ was used to indicate a rating greater than 5.

DYE FASTNESS RATINGS:

N—Negligible
R—Redder
D—Duller
Y—Yellower
Bl—Bluer
B—Brighter

METHOD OF EVALUATING DEGRADATION OF RUBBER BACKING:

Physical Degradation

5—No apparent change
4—Slight embrittlement or tackiness
3—Moderate embrittlement or tackiness
2—Severe embrittlement or tackiness
1—Totally resinified, no rubberiness apparent

Color Degradation

5—No apparent change
4—Slight browning
3—Moderate browning
2—Appreciable browning
1—Severe browning
B—Embrittlement
T—Tackiness

LITERATURE CITED

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(2) Milliken, Lewis T, *Rubber Age* 71, 64-6 (1952).
(3) Martens, R I and Githens, R E, *Anal Chem* 24, 991-3 (1952).

ACKNOWLEDGMENTS

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Ciba Co, Inc
Dalton Carpet Coating Co
Dees Adhesives & Chemicals Co
Dixie Belle Rug Co
E I du Pont de Nemours & Co, Inc
General Dyestuff Co
General Latex and Chemical Co
Geigy Chemical Corp
Morningside Chemical Co
Sandoz Chemical Works, Inc
Southern Latex Corp
Tufted Textile Mfg Assoc

Mid-West Section———

THE CHEMNYLE† PROCESS FOR DYEING FILAMENT NYLON*

WALTER H HINDLE

The Chemstrand Corp
Decatur, Ala

The discussion covers a brief history of the dyeing of filament nylon. The writer stresses that hitherto good colorfastness in conjunction with freedom from dyeing non-uniformities have been difficult of attainment. Now, by means of the Chemnyle process which the writer discusses in detail, the chief nylon dyeing problem has been overcome.

INTRODUCTION

THE purpose of tonight's talk is to discuss the dyeing of filament nylon in the yarn, package, woven piece, knit piece and half-hose form by the newly developed Chemnyle method of filement nylon dyeing. Before embarking upon this phase of the discussion, it might be well to review briefly the very short history of filament nylon from a dyeing standpoint.

Nylon, discovered by Dr Carothers, and developed by the Du Pont Company, was the first truly man-made fiber to reach the textile market in major volume. The consuming public had only a brief time to appreciate the potential value of filament nylon before World War II took it almost completely out of the civilian market. The performance of filament nylon in the war effort, in conjunction with its scarcity in the normal textile market, served to cover nylon with an aura that had not previously been accorded to any textile fiber. Many of us will recall that the first filament nylon fabrics to reach the market were erstwhile parachutes that sold exclusively on the basis of inherited glamour. As for the dyeing of it, almost anything went, and the fact that it outlived and overcame these early debacles spoke well for the intrinsic value of nylon. However, when fabrics of real commercial value were finally developed, it rapidly became obvious that, because of inherent qualities of filament nylon and its susceptibilities from a processing standpoint, level dyeing and colorfastness were going to present a very serious problem. Unlike other man-made fibers that issued after the entry of nylon into the textile market, there were no insuperable difficulties in applying color *per se*, but it soon developed that the choice as to method of dyeing lay between the use of disperse (acetate) dyestuffs, which gave good dyeing uniformity and poor overall color fastness, and wool dyestuffs, which gave good colorfastness but poor coverage of the non-uniformities existing in filament nylon yarns and fabrics. The method eventually selected was a compromise and one in which attempts were made to combine the advantages of both systems without incurring the disadvantages of either.

For a number of years, therefore, dyers have been using mixtures of disperse and neutral-acid types for dyeing filament nylon and have labored between the devil of colorfastness and the deep blue sea of levelness to the complete satisfaction of no one. The net result has been that, although nylon has been in the textile field for seventeen years, it can be truthfully said that at no time has the dyeing been worthy of the fiber.

On the one hand, we have had fabrics that, because of fiber properties, have been well able to withstand the rough and tumble of vigorous wear; but, on the other hand, have met with limited acceptance because of washfastness requirements contingent upon vigorous wear. How many of us have had personal experience in observing that, whereas filament nylon blouses and lingerie have provided excellent lasting qualities but have been discarded because of loss of color to a point unacceptable to the wearer? Brightness of shade, which is so important in stimulating my lady's fancy, has been greatly limited by the need for using disperse dyestuffs, whereas the acrylics have forged ahead in a number of fields where shade brilliance is important. How many of us have had difficulties with nylon half-hose where dark shades have bled freely even after numerous washings? The development of texturizing processes has greatly widened the scope of filament nylon products, but at the same time dyeing difficulties have been greatly increased. The consumer is not apt to regard second quality merchandise as being of any of his immediate concern, but from a factual standpoint, of necessity, first quality merchandise must carry the cost of seconds and in certain textile fields, particularly half-hose, seconds have run alarmingly high due to the lack of dyeing uniformity which manifested itself in rings and flashes. With the ever-increasing colorfastness that has been developing on other fibers, both natural and synthetic filament nylon has been at an extreme disadvantage from this competitive standpoint and it became obvious that the situation could not be permitted to continue if nylon, in the apparel field, were not to be seriously handicapped.

DISCUSSION

HISTORY OF DEVELOPMENT ———Because of its great interest in filament nylon, it obviously became a matter of primary importance to the Chemstrand Corporation that the aforementioned difficulties be overcome. You may well be interested in the organization and means developed almost eighteen months ago for dealing with the problem.

A team consisting of a dyeing scientist, an application chemist, a plant chemist and dyer, with several assistants, was organized based on the premise that any finalized method must find acceptance on the part of each of these elements and that each one had much to contribute towards the development of a practical method that would work on a commercial scale.

The scientist concerned himself with the study of dyeing mechanisms in relation to nylon fabrics and yarns containing dye-level-variation potentials from known causes. For example, a fabric was made with yarns containing streaky dyeing potential for reasons of variation in orientation brought about by stretching or relaxing under controlled conditions. Another study involved a deliberate and well-considered chemical variation of the nylon itself insofar as amino and carboxylic endgroups were concerned to an extent not considered possible of reproduction under normal control conditions of nylon manufacture. Still another study was based on streakiness deliberately induced by variations in the various texturizing processes.

Three main avenues of approach then presented themselves. The physical differentials could possibly be equalized by an attempt to remove the variations in fiber orientations by means of fiber swelling. A

*Presented before the Mid-West Section on October 27, 1956.
†Patent applied for

second approach lay in mordanting the variations in such a way that the mordant itself became the controlling factor in uniformity rather than the nylon. The third alternative was to consider the changing of the dyeing mechanism of dyestuffs known to have good fastness properties on nylon in such a way that they would more nearly conform to those of disperse dyestuffs, which normally give excellent uniformity.

The dyer and the plant chemist rejected the first idea on the basis of cost and difficulties in handling. It was pointed out that the dyeing of filament nylon is a highly competitive operation and the cost incurred by the use of swelling agents together with the extra processing required to remove them, would make such a process not commercially profitable. The application chemist rejected the second alternative on the basis of problems of control. Therefore, the scientist was left the last alternative.

The scientist's first approach was to determine by what means acid and direct dyestuffs known to possess good fastness on nylon could be precipitated from solution and then be redispersed. Precipitates based on excess acid were found to be of no value because a redispersion under conditions of high acidity promoted a rapid dye strike and a multiplicity of dye spots and blotches. Precipitation by the addition of electrolytes proved quite impractical of application because of the effects of these salts on the dispersants and the extremely slow rate of dyeing made for extremely long dyeing times and limited build-up in shade. A wide variety of cationic materials including quaternary ammonium salts was studied in relation to their ability to precipitate direct and acid dyestuffs in such a way as to be subsequently redispersable. A number of these types of material were evaluated with great degrees of differences in the kind of result obtained. Some of the precipitates became too highly aggregated such as to cause color spotting. Other types of precipitate provided a particle size too great to permit effective penetration, and still other types of precipitate would cause a rapid plating of the surface of the fiber without effective penetration.

It was from this welter of confusing results and using the microdyeoscope as a tool that the dyeing scientist was able to determine the precise type of redispersable precipitate that would dye filament nylon to cover non-uniformities within commercial dyeing times. Another factor that had to be taken into consideration was that many of the materials used had an adverse effect upon lightfastness, and this problem posed a stumbling block for many weeks. When what appeared to be the ideal type of dispersion was obtained, consideration then had to be given to problems which were encountered in governing rates of dyeing. Evaluation of two hundred and twenty direct and acid dyestuffs developed the information that approximately thirty-five could be applicable to filament nylon by what is now known as the Chemnyle process. However, there were three separate and distinct groups of dyestuffs within the first thirty-five that could be classified as rapid, medium and slow dyeing and although, by now, excellent self shades were being obtained that indicated freedom from streaks and flashes, the problem of tertiary combinations still remained unsolved. Considerable study was, therefore, given to the selection of dyestuffs with similar dyeing rates under the conditions of the Chemnyle system of dyeing, and as a result of this study a full color range was developed that may be applied to filament nylon using tertiary combinations whose constituent parts draw at the same rate. Using the selected combinations of dyestuffs, which could be all acid colors or all direct colors, or mixtures of each, and under standard conditions of pH, a full shade range of shades with freedom from the usual streakiness and with the kind of colorfastness normally associated with those dyestuffs on nylon became available. It should be pointed out that the Chemnyle process *per se* does not improve colorfastness but permits the application to filament nylon of many of those dyestuffs which normally have good fastness properties but which dye in non-uniform fashion.

At this juncture, it became obvious that the rapidly developing process had remarkable commercial possibilities and for purpose of commercial reference the name CHEMNYLE was given to the process.

Reduction to commercial practice was carried out on production scale on shades selected by dyers, as those normally presenting major difficulty insofar as uniformity was concerned. In the woven field, the shades usually selected were tans and grays, in the tricot field, brilliant scarlets and pastel blues, and in texturized nylon sweaters and half-hose the same series of shades was called for. No work was carried out in the women's hosiery field initially as colorfastness was not considered a serious problem. Washing temperatures in this latter field seldom exceeded bearable hand temperatures and the need for laundry washing did not exist.

The results of the first production trials entirely confirmed laboratory findings, and it became obvious that the commercial aspects of the process were far reaching in the extreme. Not only was the colorfastness of filament-nylon-dyed goods going to be radically increased, but also color styling had become a factor based on the availability of brilliant colorings provided by acid dyestuffs formerly not usable because of non-uniform dyeing properties. The question of seconds due to non-uniform dyeing also came into consideration, which, combined with the other advantages, emphasized the potential impact of the Chemnyle process on filament nylon from a commercial standpoint.

RESULTS——A summation of the results obtained from the Chemnyle process thus far shows that:

1) Streakiness normally associated with dyestuffs other than disperse types has been virtually eliminated in many cases and reduced to an acceptable minimum in others.

2) Good washfastness has been obtained at 120°-140°F on the basis of a normal dyeing, and at 160°F with aftertreatments. Many chrome dyestuffs yield excellent washfastness at 180°F.

3) Lightfastness is that normally associated with acid and direct dyestuffs on nylon and ranges between 15-80 hours. Selected chrome dyestuffs give lightfastness ranging from 40-80 hours, depending upon shade.

4) Shades of a brilliance not normally associated with filament nylon may be obtained.

5) The hand and touch of goods dyed by the Chemnyle process is of a softer, fuller and more rounded nature than obtained by normal methods.

METHOD——The Chemnyle method of dyeing is of an extremely simple nature and requires no profound technical knowledge for its application. The filament nylon goods, in whatever form they may be, are prepared conventionally. They are then treated for a period of 10 minutes in from 2-3% Chemnyle dyeing assistant, 2% Triton X-67 and formic acid to provide a pH of approximately 3.5%. The recommended dyestuff solution is added to the bath and the

dyeing is carried out at 190°-200°F in conventional fashion. After color matching, the dyeing is washed off at 160°F, and if 160°F washfastness is required, the goods should be after-treated in the recommended fixing agent for the specific dyestuffs. Katanol 0-50 and Chromofix B are among those found to be of advantage. Chrome dyestuffs may be used to great advantage in shades ranging from light medium to black. The colors are chromed by conventional methods to give good washfastness at temperatures ranging from 160°F to the boil.

DYESTUFF SELECTION——— The question of dyestuff selection is of paramount importance, for it has been established that there are what may be classified as slow, medium and fast drawing colors, and although it is preferable to use dyestuffs from a given classification, mixtures of slow and medium, and medium and fast drawing types are permissible. Interestingly, rates of drawing of individual dyestuffs may be entirely different under Chemnyle conditions from those under normal dyeing conditions and it is also interesting to note that all types of the selected dyestuffs, which may be direct, milling or acid, are applied from the same amount of formic acid.

Dyestuff selection, is also very important from the standpoint of colorfastness, both to light and washing, and it should be pointed out that the use of the Chemnyle process is not an automatic guarantee of good fastness. The dyestuffs which you will see listed are those which careful research has shown to possess the listed properties. Prototypes may conceivably work equally well but it is stressed that standardizing materials may adversely affect results.

CONCLUSION

Work up to this point shows without equivocation that wetfastness of a very high order is produced on filament nylon. Lightfastness up to this point is equivalent to that normally produced on nylon with the types of dyestuffs listed which are, of course, superior to disperse types. In the main, thus far, it can be said that selected chrome type dyestuffs give lightfastness from 20-100 Fade-Ometer hours. Neutral-dyeing premetalized types have not been found to be capable of application by the Chemnyle method at the time of writing.

A development not previously disclosed is the fact that certain optical bleaches may be applied by the Chemnyle process to give extremely uniform results, whereas application under normal conditions showed the same non-uniformities associated with acid dyestuffs. This development may also have far-reaching importance as whites have hitherto presented serious problems.

That the dyeing industry was eagerly waiting for such a development is shown by the fact that over one hundred dyeing and finishing companies have already made application for a license to use the Chemnyle process, and it is believed that the formalities connected with licensing are almost completed, at which point Chemstrand dying technicians will be available for plant demonstrations. The dyeing assistant will be made available at a cost of approximately forty cents per pound in drum quantities.

We, of the Chemstrand Corporation, were honored by your invitation to present the Chemnyle story to the Mid-West Section of the AATCC. We believe that it represents a development in nylon dyeing on which a great deal of future work will be patterned.

STATEMENT SUMMARIZING CASH RECEIPTS AND DISBURSEMENTS OF AATCC FOR THE YEAR ENDED JULY 31, 1956

TO THE Members of the American Association of Textile Chemists and Colorists:

We have made an examination of the accompanying statement and supporting schedule summarizing the cash receipts and disbursements of the treasurer and secretary of the American Association of Textile Chemists and Colorists for the year ended July 31, 1956. In connection therewith, we examined or tested the cashbooks and other records supporting the receipts and disbursements by methods and to the extent we deemed appropriate, but we did not communicate with the members to confirm the amount of recorded receipts from dues and subscriptions.

In our opinion, the accompanying statement and supporting schedule fairly summarize the recorded cash receipts and disbursements (excluding receipts and disbursements on sales and purchases of investment securities) of the Association for the year ended July 31, 1956 and the balances of cash in banks, advance expense funds, and securities owned as of that date.

PRICE WATERHOUSE & CO

75 Federal Street
Boston 10, Mass.
August 29, 1956

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS

SCHEDULE OF MISCELLANEOUS INCOME
YEAR ENDED JULY 31, 1956

Research:		
Launder-Ometer royalties	$ 326.50	
Grey scales	266.83	
Accelerotor liners	513.50	
Miscellaneous	168.50	$ 1,275.33
Sales of technical supplies, royalties, etc.:		
Yearbooks	$3,545.35	
Dye standards	1,389.17	
Knitted tubing	186.60	
Dyestuff Reporters and reprints	202.65	
Crock-meter cloth	776.22	
Crock meters	3,192.22	
Moth cloth	245.00	
Multi-fiber cloth royalties	2,980.39	
Flammability tester royalties	169.00	
Water-test apparatus	540.79	
Gas fading units	94.00	
Color transference charts	725.00	
Analytical Methods Monograph #1	15.00	
Buttons, etc.	45.75	
Application of Vat Dyes Monograph #2	1,571.60	
Cotton skeins commissions	77.11	
Standard grease wool	247.00	
Accelerotor royalties	325.00	16,327.85
Total miscellaneous income		$17,603.18

TREASURER'S REPORT

TREASURER'S REPORT

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS
STATEMENT SUMMARIZING CASH RECEIPTS AND DISBURSEMENTS — YEAR ENDED JULY 31, 1956
(excluding receipts and disbursements on sales and purchases of investment securities

		Allocation of funds								
	Total	General research	Philadelphia Section Research Project	Colour Index—Second Edition (See footnote) Receipts	Colour Index—Second Edition (See footnote) Disbursements	American Dyestuff Reporter Prize Award Fund	Olney Medal Fund	Convention Fund	Technical supplies	General
Receipts:										
Membership dues:										
Corporate memberships	$ 61,220.00	$ 57,900.00								$ 3,320.00
Sustaining memberships	665.00	665.00								
Senior, Junior, Associate and Student Memberships	68,205.30									68,205.30
Total membership dues	$130,090.30	$ 58,565.00								$ 71,525.30
Net amount received from Philadelphia Section—1955 Convention	10,243.84							$10,243.84		
Dividends and interest received	10,641.07	4,469.52		$ 644.48		$ 273.50	$ 542.80			4,710.77
Miscellaneous income, per accompanying schedule	17,603.18	1,275.33							$16,327.85	
Total receipts	$168,578.39	$ 64,309.85		$ 644.48		$ 273.50	$ 542.80	$10,243.84	$16,327.85	$ 76,236.07
Disbursements:										
Research salaries and expenses	$ 56,311.42	$ 56,311.42								
Howes Publishing Company—Subscriptions to American Dyestuff Reporter	20,483.42								$ 2,330.29	$ 18,153.13
Convention expenses paid in advance by the Secretary, less reimbursements	1,323.62							$ 1,323.62		
Secretary's expenses, clerical assistance, etc.	33,266.08								3,143.20	30,122.88
American Dyestuff Reporter Prize Award	200.00					200.00				
Publicity	2,073.62	1,534.22								539.40
Purchases of technical supplies for resale	5,789.33								5,789.33	
Section membership allowances	5,586.65									5,586.65
Philadelphia Section Research Project	950.00		$ 950.00							
Colour Index	182.93				182.93					
Olney Medal Fund	111.10						111.10			
Employees' group life insurance	667.56	424.81								242.75
Other general expenses	1,330.54									1,330.54
Total disbursements	$128,276.27	$ 58,270.45	$ 950.00		$ 182.93	$ 200.00	$ 111.10	$ 1,323.62	$11,262.82	$ 55,975.35
Excess (deficiency) of receipts over disbursements	$ 40,302.12	$ 6,039.40	($ 950.00)	$ 644.48	($ 182.93)	$ 73.50	$ 431.70	$ 8,920.22	$ 5,065.03	$ 20,260.72
Cash in banks, advance expense funds and investments (at cost), July 31, 1955	355,803.39	114,867.25	2,000.00	21,312.96	(41,693.05)	8,235.76	7,118.74	34,083.61	23,188.19	186,689.93
Cash in banks, advance expense funds and investments (at cost), July 31, 1956	$396,105.51	$120,906.65	$1,050.00	$21,957.44	($41,875.98)	$8,309.26	$7,550.44	$43,003.83	$28,253.22	$206,950.65

Summary of cash in banks, advance expense funds and investments at July 31, 1956:		
Cash in banks—checking accounts		$ 29,029.15
Cash in savings bank accounts		59,494.94
Advance expense funds		9,000.00
United States Government obligations, at cost:		
Savings Bonds (value at Maturity $37,000; redemption value at July 31, 1956 $32,425)	$ 32,800.00	
Treasury Bonds, etc. (face amount $155,000; value based on market quotations July 31, 1956 $153,812)	154,113.38	186,913.38
Other marketable securities, at cost (value based on market quotations July 31, 1956 $193,574)		111,668.04
		$396,105.51

Note: Under the agreement dated January 18, 1952, between the Association and The Society of Dyers and Colourists of Bradford, England, all costs incurred in connection with the compilation, printing, distributing, etc. of the "Colour Index (Second Edition)" are to be borne equally by the parties thereto. Future net losses or revenues arising from the production and sale of this work are likewise to be borne or shared equally by the parties. The Association's total commitment under the agreement, representing half the presently estimated cost of production, is approximately $126,000. The Association and the British Society, each in their respective territories, are receiving subscriptions in advance of publication to assist in financing the project. As at July 31, 1956, the Association on its part had expended for salaries and other costs a total amount of $41,875.98 and had received $21,957.44, including $20,400.88 for advance subscriptions and $1,556.56 for interest on savings bank deposits. The British Society has reported that, as of December 31, 1955, it had expended £17,581 for costs and expenses and had received £17,100 for advance subscriptions and £405 for interest on bank deposits. The joint agreement requires annual equalization settlements between the parties with respect to costs paid and revenues received by each. Because of British exchange restrictions, the annual equalization settlements through December 31, 1955 have been waived by mutual agreement.

Respectfully submitted:
ALBERT E. SAMPSON
Treasurer
American Association of Textile Chemists and Colorists

AATCC Calendar

COUNCIL

Jan 18 (Hotel Statler, New York); Mar 29 (Roanoke, Va); June 7 (New York)

NATIONAL CONVENTIONS

Nov 14-16, 1957 (Hotel Statler, Boston); 1958 (Hotel Conrad Hilton, Chicago); 1959 (Sheraton Park and Shoreham Hotels, Washington, D C); 1960 (Philadelphia, Pa); 1961 (Buffalo, NY)

DELAWARE VALLEY SECTION

Jan 11 (site to be announced)

HUDSON-MOHAWK SECTION

Jan 25 (Jack's Restaurant, Albany, NY); Mar 29 (Johnstown, NY); May 17 (Ladies Nite —Schuyler Meadows, Albany, NY); June 21 (Outing—Antlers Country Club, Amsterdam, NY)

MID-WEST SECTION

February 16 (Hotel Bismarck, Chicago, Ill)

NEW YORK SECTION

Jan 23, Mar 1 (Hotel Delmonico, New York, NY); Apr 26, May 24—ladies nite (Kohler's Swiss Chalet, Rochelle Park, NJ); June (Annual Outing)

NIAGARA FRONTIER SECTION

Jan 11, Mar 15 (Buffalo, NY); Apr 5 (Joint meeting with CATCC at Kitchener, Ont)

PIEDMONT SECTION

Jan 26 (Poinsett Hotel, Greenville, SC); Mar 30 (Hotel Roanoke, Roanoke, Va); June 7-9 (Outing—Mayview Manor, Blowing Rock, NC); Sept 28 (Hotel Barringer, Charlotte, NC)

RHODE ISLAND SECTION

Jan 24 (Johnson's Hummocks Grille, Providence, RI)

SOUTHEASTERN SECTION

Feb 22 (Pepperell, Ala); Apr 13 (Lindale, Ga); June 6-8 (Outing—Radium Springs, Ga); Sept 14 (Columbus, Ga); Dec 7 (Atlanta, Ga)

Employment Register

This column is open for two insertions per year, per member, without charge. Blanks can be obtained from, and filed with, the secretary of the Association, Post Office Box 28, Lowell, Mass. It is understood that these will be open to inspection by prospective employers who can obtain further information from the secretary.

56-15

Education: High school graduate; Rhode Island School of Design—2 years of chemistry.

Experience: 25 years superintendent-general manager—dyeing, printing and finishing.

Age: 55; married; references.

Position desired: Superintendent or manager, textile printing plant.

Location: New England preferred; will travel. 12-17, 12-31

Future Papers

The following material has been submitted to date to the publishers of American Dyestuff Reporter. Subject to the approval of the AATCC Publications Committee, it will appear in the Proceedings in future issues.

Authors, section officials, and committee chairmen are requested to inspect this list and notify the publishers if there are any omissions.

Papers presented at the Perkin Centennial under AATCC sponsorship:

"The Development of Fast Colors for Textiles"—F M Fordemwalt, American Cyanamid Co

"The Development of the Art of Textile Printing"—Herman P Baumann, American Aniline Products, Inc

"The Development of Modern Textile Dyeing Techniques"—P L Meunier, E I du Pont de Nemours & Co, Inc

"The Application of Colorants to Glass Fibers"—R F Caroselli, Owens-Corning Fiberglas Corp

"Internal Application of Colour in the Manufacture of Man-Made Fibers" —C E Coke, et al, Courtaulds, Ltd

"The Sulfur Dyes"—J L Crist and R E Rupp, Southern Dyestuff Corp

"Cationic Softeners—Their Secondary Effects on Textile Fabrics"—Philadelphia Section, AATCC

Papers presented before local sections:

"Far Infra-red for Textile Dyeing and Finishing"—W L Thomson, Edwin L Wiegand Co

"Lighting Factors to be Considered in Textile Color Matching"—Warren B Reese, Macbeth Daylighting Corp

"Progress in the Art of Bleaching" —B K Easton and N Weinberg, Becco Chemical Division

"Binders for Nonwoven Fabrics"—Neil H Sherwood, B F Goodrich Research Center

"Technology of Nonwoven Fabrics" —L G Lovin and L P Wenzell, Celanese Corp of America

"Developments of Science and Industry in the South"—Frank J Soday, The Chemstrand Corp

"Wet Processing of Lurex"—Leon E Seidel, The Dobeckmun Co

"Random Tumble Pilling Tester"—A G Scroggie, E I du Pont de Nemours & Co, Inc

Miscellaneous:

"The Interaction of Cellulose with Simple Salt Solutions and with Dyebaths"—Mary Moncrieff-Yeates and Howard J White, Jr

"Leucoesters of Vat Dyestuffs"—Hans Luttringhaus, Progressive Color & Chemical Co

Other Perkin Centennial Papers

"A Century of Progress in Colorfastness Test Methods"— M L Staples, Ontario Research Foundation

"The Standard Depths of Shade in Relation to the Assessment of Colorfastness of Dyes on Textiles"—Paul Rabe, Farbenfabriken Bayer AG

"Dyes and Dyeing Processes for Special Properties of Color"—J S Kirk, General Dyestuff Co

"Progress in Measuring Color Difference"—G W Ingle, Monsanto Chemical Co

"The Use of Color in National Defense"—S J Kennedy, Quartermaster Research and Development Command

"Seeing Light and Color"—Ralph M Evans, Eastman Kodak Co

"The Chemistry of Organic Pigments"—A Siegal and W S Struve, E I du Pont de Nemours & Co, Inc

"Color in Relation to the Political and Economic History of the Western World"—S M Edelstein, Dexter Chemical Corp

"Color in Ancient Times"—Earle R Caley, Ohio State Univ

"Color Designation through the Ages"—Ernest R Kaswell, Fabric Research Laboratories, Inc

"America's Debt to Perkin"—Samuel Lenher, E I du Pont de Nemours & Co, Inc

"Early Synthetic Dyes"—Hans Z Lecher, consultant

"Synthetic Dyes for Cotton"—D I Randall, General Aniline & Film Corp

"Dyes for Animal Fibers"—James Ogilvie, National Aniline Div

"Dyes for the Hydrophobic Fibers" —H E Schroeder and S N Boyd, E I du Pont de Nemours & Co, Inc

"Fluorescent White Dyes"—Robert S Long, American Cyanamid Co

"The Theory of Dyeing Cellulosic Fibers"—Emery I Valko, Onyx Oil & Chemical Co

"Theory of Dyeing Polyester and Polyacrylic Fibers"—W R Remington and H E Schroeder, E I du Pont de Nemours & Co, Inc

ACTIVITIES OF THE LOCAL SECTIONS

Rhode Island

AT the Annual Meeting of the Rhode Island Section, held December 6th at Johnson's Hummocks Grille, Providence, RI, George Arris, business and financial editor of the *Providence Journal-Bulletin*, and Frank Leslie, president of Leslie and Co and general partner, Clinchfield Mfg Co, presented papers concerning the textile business.

Mr Arris' paper, "What's Ahead in '57", presented the financial picture for textiles and business in general for the forthcoming year. Mr Leslie spoke on "The Future of Textiles".

During the business meeting, the following slate of officers and committeemen was approved: *Chairman*—R F Caroselli, Owens-Corning Fiberglas Corp; *Vice chairman*—Thorwald Larson, Carbic Moss Corp; *Treasurer*—Harold Sturtevant, Rhode Island School of Design; *Secretary*—James J Dillon, King Phillip Finishing Co; *Councilor*—J William Timperley, Kenyon Piece Dye Works; *Sectional Committee*—Alberic T Di Masi, Products Development Laboratories; Arthur W Grover, Enterprise Dye Work; C Eric Neale, Apponaug Co; Charles Stokes, Carbic Moss Corp; *Nominating Committee*—F H Casey (chairman), Sandoz Chemical Works, Inc; Ernest J Chornyei, Bradford Dyeing Assoc; Edward H Gamble, E I du Pont de Nemours & Co, Inc; Raymond B Taylorson, Verona Dyestuffs.

Among those present at the meeting, which attracted 160 members and guests, were: Raymond W Jacoby, AATCC president; George O Linberg, president-elect; George P Paine, executive secretary-assistant treasurer; and Ernest V Kaswell, vice president, New England Region.

The next meeting will be held at Johnson's Hummocks Grille on Thursday, January 24.

Northern New England

THE Northern New England Section met on December 7 and elected sectional officers for 1957. Milton Harris, Harris Research Laboratories, gave a paper on "Chemistry as Related to the Useful Properties of Textiles".

The following slate of officers was elected unanimously. *Chairman*—Edward B Bell, Textile Aniline & Chemical Co; *Vice chairman*—Robert D Robinson, Bachmann-Uxbridge Worsted Corp; *Treasurer*—William W Pennock, E I du Pont de Nemours & Co, Inc; *Secretary*—Azel W Mack, Dexter Chemical Corp; *National Councilors*—Philip S Durfee, W C Durfee Co, Inc; John J Healy, Gonic Mfg Co; and Frank J Rizzo, Quartermaster Corps Research & Development Command; *Sectional Committee*—Fritz E Kobayashi, Malden Spinning & Dyeing Co, Inc; Walter E Flister, Barre Wool Combing Co, Ltd; Robert J Peirent, Lowell Technological Institute; and Hans G Walz, Sagamore Color & Chemical Co.

John Gould, outgoing chairman, addressed the new group, presenting past accomplishments and giving suggestions for future co-operative efforts.

NNE SECTION SCHOLARSHIP FOR LTI STUDENT—Leonard T Coppeta, a senior at Lowell Technological Institute, was awarded the eighth annual Northern New England Section full-tuition scholarship at a meeting of the LTI Student Chapter on December 11. (L to r): Prof Robert J Peirent, LTI Chemistry Dept; George P Paine, executive secretary-assistant treasurer, AATCC; Martin J Lydon, president, LTI; Mr Coppeta; Henry Millson, American Cyanamid Co, guest speaker at the meeting; and Alan A Denio, chairman, LTI Student Chapter.

Southeastern

THE Southeastern Section held its last meeting of the year at the Dinkler Plaza Hotel, Atlanta, Ga on December 8. The meeting, arranged by Marc V Shivers of Thomaston Mills, attracted 110 members and guests.

The technical session featured talks on resin finishing by Larry Q Green of E I du Pont de Nemours & Co, Inc, and Theodore F Cooke of American Cyanamid Co.

During dinner, new officers for 1957 were presented, after which H Gillespie Smith awarded the Section's scholarship in textile chemistry for the coming term to Paula Stevenson, the first female student to be enrolled at Georgia Tech's School of Textile Chemistry. It was decided that the Section would offer a second scholarship for the coming term.

Niagara Frontier

THE Fall Meeting of the Niagara Frontier Section was held at Canisius College, Buffalo, NY, on Friday, November 2, 1956 with 35 members in attendance.

Bernard K Easton, manager, Textile Section, Becco Chemical Division, Food Machinery & Chemical Corp, presented a paper entitled "Progress in the Art of Bleaching", tracing the history of bleaching from the year 300 BC to the present. Modern techniques employed in the bleaching of natural and man-made fibers by continuous and by batchwise methods were outlined in detail.

During the business session, Mr Easton reported on the 203rd meeting of the Council, at which it was voted to hold the 1961 National Convention in Buffalo.

* * * * *

The Niagara Frontier Section held its final meeting of 1956 on December 7th in the Science Building, Canisius College, Buffalo, NY, at which 26 members and guests were present to hear Charles L Zimmerman, assistant research director, Dan River Mills, speak on "Some New Approaches in High-temperature Dyeing".

During the business session, the following slate of officers for 1957 was elected: *Chairman*—William H Leyking National Aniline Div; *Vice chairman*—Kenneth A Lister, Canadian Industries Ltd; *Secretary*—Norbert Weinberg, Becco Chemical Div; *Treasurer*—Anton Viditz-Ward, Van Raalte Co Inc; *Councilor*—Bernard K Easton; *Sectional Committee*—Hans O Kauffmann, Becco Chemical Div; Arthur J Tigert, Resin-Tex Ltd; Jean G Kern, National Aniline Div; N J Mohoruk, Hamilton Cottons.

MEMBERSHIP APPLICATIONS FOR JANUARY ELECTION

December 14, 1956

SENIOR

Norman L Anderson — Research chemist, Nat Aniline Div, Allied Chemical & Dye Corp, Buffalo, N Y. Sponsors: E W Clark, F J Domlik.

Charles J Baeringer—Dyer, chemist, Eagle Dyeing & Finishing Co, Mt Holly, N J. Sponsors: C Baeringer, J K Gass, Jr.

Fred Beesley — Dyer, Dominion Woollens & Worsted, Hespeler, Ont, Canada. Sponsors: K A Lister, A T Thorne.

Hervey F Beutler—Chem engr, fiber treatment prod engr, Dow Corning Corp, Midland, Mich. Sponsors: E M Eddington, F L Dennett.

George Haag—Pres & head, Engineering Dept, Kragmar Inc, Paterson, N J. Sponsors: N Manfra, M Manfra.

Hidetoshi Irie—Chief chemist, Japan Reichhold Chemicals, Inc, Tokyo, Japan. Sponsors: H W Stiegler, G J Mandikos.

Thomas B Kay—Mgr, Thomas Kay Woolen Mfg Co, Salem, Ore. Sponsors: F H Ihlenburg, T M Marshall.

Leonard H Platnick—Sales engr & consulting engr, Cosa Corp, New York, N Y. Sponsors: C A Whitehead, N A Johnson.

Charles B Ratcliffe — Chemist, Courtaulds, Inc, Mobile, Ala. Sponsors: H F Wise, G V Lund.

Charles R Welch—Senior techn in finishing, Celanese Corp of America, Charlotte, N C. Sponsors: D H Hellman, G C Ward.

David M Willis—Dyer, The Powell Knitting Co, Spartanburg, S C. Sponsors: T Newton, F E Wilson.

ASSOCIATE

Victor K Boyajian—Executive in dyeing & processing, Lanex Dyeing & Processing Corp, Guttenberg, N J.

Kenneth J Campbell—Administrator, gen services, Gen Aniline & Film Corp, New York, N Y.

Frederick J DiCarlo — Head, Biochemistry Div, The Fleischmann Labs, Stamford, Conn.

Mauro Grossi—Techn mgr, Grossi & Tagliabo S A Prodotti Chimici, Milan, Italy.

Arthur F Howey—Prod res engr, The Proctor & Gamble Co of Canada, Hamilton, Ont, Canada.

Kinji Matsuki—Dir & dyes techn, Meisei & Co Ltd, Osaka, Japan.

Majer Rubin—President, California Jersey Mills, Los Angeles, Calif.

Lytton Taylor—Techn sales & service, Archer Daniels Midland Co, Atlanta, Ga.

APPLICATION FOR TRANSFER TO SENIOR MEMBERSHIP

Fred H Steiger

STUDENT

Marybelle H Clark—Purdue University. Sponsor: R W Padgett.

Rene C Arsenault—Bradford Durfee Techn Inst. Sponsor: J Watters.

Everett E Backe—Bradford Durfee Techn Inst. Sponsor: J Watters.

Robert Borge — Bradford Durfee Techn Inst. Sponsor: J Watters.

Edwin C Boyle—Bradford Durfee Techn Inst. Sponsor: J Watters.

Norman A Burns—Bradford Durfee Techn Inst. Sponsor: J Watters.

Kenneth P Conroy—Bradford Durfee Techn Inst. Sponsor: J Watters.

Edward I Creamer, Jr — Bradford Durfee Techn Inst. Sponsor: J Watters.

John F Giblin, Jr—Bradford Durfee Techn Inst. Sponsor: J Watters.

John P Loftus — Bradford Durfee Techn Inst. Sponsor: J Watters.

Donald G Martin—Bradford Durfee Techn Inst. Sponsor: J Watters.

NOTICE

To ensure that the activities of your Section receive proper publicity in the Proceedings, it is desirable that material be submitted direct to American Dyestuff Reporter, 44 E 23rd St, New York 10, N Y.

ADVANCE NOTICES OF MEETINGS———Copy must be submitted *at least two weeks* prior to the publication date. ADR is published on alternate Mondays. It is urged that that dates be taken into consideration when copy is submitted.

Advance notices should include the date and site of the meeting; the speaker's name, position, business affiliation, and subject; a short abstract of the paper (optional); details of additional meeting highlights, eg, nominations or election of officers, special awards, activities of Sectional committees, etc.

MEETING REPORTS———Complete reports should be submitted as soon as practical after a meeting. Information should include attendance figures; captioned photographs of meeting principals (speaker, section officials, etc); and any additional points not covered in the advance notice. An extensive resume of the speakers' remarks is not necessary if the paper is to be submitted for full publication in the Proceedings.

PAPERS———Two copies of each paper presented before local sections should be sent to the offices of the American Dyestuff Reported. It is very important that every speaker be acquainted with the "Notice to Authors", which appear periodically in the Proceedings. Additional copies of said notice will be sent to section officials on request.

It is imperative that each Section appoint an official whose responsibility it is to see that the speaker's remarks are submitted. In cases where prepared manuscripts are not immediately available to the Section official, it may be necessary to acquaint the author with the address to which he should send his material when it is finally prepared.

In cases where the material is extemporaneous (panel discussions, question-and-answer periods, open forum, etc) it is the responsibility of the Section to provide for stenotype service, so that a complete record may be available.

PRESENTATION OF A PAPER BEFORE A LOCAL SECTION DOES NOT GUARANTEE PUBLICATION in THE PROCEEDINGS, AS THE FINAL DECISION RESTS WITH THE AATCC PUBLICATIONS COMMITTEE. However, most papers will be acceptable provided they conform in content and layout to established practices of AATCC.

NOTICE TO AUTHORS OF PAPERS

MANUSCRIPTS for the *Proceedings* and for other publications of the American Association of Textile Chemists and Colorists shall conform to the requirements and standards given in this *Notice*. Before publication, manuscripts for the *Proceedings* shall be approved by the Editor, not only for editorial correctness according to the standards of this *Notice*, but also for content of technical matter. In his work, the Editor may enlist the aid of anonymous reviewers who are selected for expert knowledge in particular fields.

It is presumed that authors in studying the comments of reviewers and of the Editor will remember that all recommendations are made in a kindly, helpful, sympathetic manner to improve the paper in both literary and technical excellence. Although authors should cheerfully consider suggestions, they are expected to defend their position if justified, especially when strictly technical matters are involved with which the authors have an intimate knowledge.

AATCC strives to maintain a high scientific and professional standard for papers. Authors must make every effort to avoid the use of trade names, commercial products or process names wherever such use may be construed as advertising. Wherever possible, scientific nomenclature must be employed. It is recognized that in some instances trade names are necessary to avoid lengthy description. Certain trade names have been so widely used as to become generic and these normally are permissible. Further, some technical papers may involve the presentation of a new product or process wherein trade name reference is obligatory.

Giving due consideration to such valid exceptions, it is incumbent upon the author to maintain the proper scientific attitude, avoiding any expressions or devices aimed at promoting a particular product or process.

Questionable papers are to be referred to the chairman of the Publications Committee, who will submit them to an editorial board which would be appointed as needed. The Board would report to the Publications Committee, which would have the final voice in accepting or rejecting a paper.

MANUSCRIPTS — Manuscripts shall be typewritten double-spaced with approximately one-inch margins on 8.5x11-inch white paper. In addition to the *original*, at least one carbon copy is required. Pages are to be numbered consecutively with Arabic numerals, and each page after the first shall carry the authorship at the very top. Tables and figures shall also be numbered consecutively, the tables with headings containing Roman numerals as TABLE I, TABLE II, etc, and the figures with Arabic numerals as Figure 1, Figure 2, etc, appearing *below* the figures. The names of the authors and their laboratories or business connections should appear below the title of the paper.

LITERARY STYLE AND FORM OF PRESENTATION—In the writing of papers, authors are requested to observe a trenchant, simple style of writing directed to textile chemists and colorists with at least an elementary knowledge of chemistry, physics, mathematics, engineering, textile processes and textile machinery.

In the organization of the material, there should be one or more introductory paragraphs setting forth the occasion, significance and main objectives of the paper and of the method of attack. This should be followed by the body of the presentation, either with discussions interspersed throughout this portion or with a collected secton marked "DISCUSSION" after the main body of the paper. Finally, there may be a brief section at the end entiled "SUMMARY" or "CONCLUSIONS."

Center and side headings make for easier reading. Center headings should be employed sparingly and generally will include only very important section headings, such as "INTRODUCTION," "EXPERIMENTAL," "DISCUSSION," "CONCLUSIONS," "SUMMARY," and "REFERENCES." Side headings (see sixth paragraph of this *Notice* for an example) shall be indented and run into the text to which they apply, and shall be separated from the paragraph by a dash. The publisher will print center headings in bold-face capitals and side headings in capitals.

LITERATURE REFERENCES AND FOOTNOTES—References to the literature and all footnotes (except those in tables) shall be numbered consecutively with underlined Arabic numerals in parentheses at the proper place in the text. Where a reference or footnote is to be used again, the original number is simply repeated; this obviates the necessity of repeating the footnote or reference at the bottom of the page. References to the literature shall conform to the universal usages followed by *Chemical Abstracts*, which include underlining of journal names to indicate italicization in printing.

The spelling and rules of punctuation followed in manuscripts shall be those found in the "Merriam-Webster New International Dictionary"; abbreviations and chemical formulas shall conform to *Chemical Abstracts*.

FIGURE AND GRAPHS—Figures and graphs should be black line drawings on white drawing paper. Photographic prints are acceptable, preferably glossy prints on double-weight paper. Duplicates should be available for dispatch to reviewers. In graphs the frame and actual curves should be inked more heavily than the co-ordinate lines, and these latter should not be too close together. Various styles of broken lines are sometimes desirable to distinguish curves. Experimental points should be given with small plane figures, such as circles, squares, diamonds or triangles. Numbers and legends on co-ordinate axes are to be lettered in the graph by the author. Numbers and titles of figures should be placed below the diagram or on the edge of the back. Each piece of illustration copy should bear on the margin or on the edge of the back the name of the author and the title of the paper.

SYNOPSIS—A separately written synopsis of not over 200 words containing the gist of the subject matter must accompany every manuscript.

GALLEY PROOFS—Galley proofs will be sent to the author by the publisher for correction before publication. This should not be interpreted as an invitation to re-write the paper but rather as an opportunity to correct errors.

REPRINTS — Fifty reprints of papers published in the *Proceedings* will be furnished without charge by the publisher if requested when galley proofs are returned. These reprints are printed on one side of the sheet only and then stapled together. A schedule of prices of reprints in the usual form accompanies the galley proofs.

OWNERSHIP OF COPYRIGHTS AND PATENTS—All papers presented at general meetings of the Association or at meetings of any of its local sections and all communications shall become the property of the Association. Such papers are not to be published elsewhere until they have appeared in the *Proceedings* of the Association. Papers published in the *Proceedings* are copyrighted by the Association. Any patentable disclosures shall of course remain the property of the author or authors.

TRADE-MARKS—As the AATCC wishes to co-operate in the protection of trade-marks, it is requested that, in the body of the article, trade-marks be written with an initial capital letter.

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(Effective Jan 1, 1957)

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• PATENT DIGEST •

PAUL WENGRAF

CUPROUS-ION TECHNIQUE IN DYEING POLYACRYLONITRILES———Water-Soluble Dyes Used C,4,07

USPat 2,743,991 (Union Carbide & Carbon Corp—Schoonover, Field Jr, Purse——May 1, 1956)

Fibers made from acrylonitrile-containing polymers can be dyed with the disperse dyes commonly used in the dyeing of cellulose acetate. This specification states that water-soluble dyes of the acid or direct type and water-soluble acetate dyes have little or no affinity for the acrylonitrile homopolymers or copolymers with vinyl compounds such as vinyl acetate, vinyl chloride, vinyl pyridine, acrylamide, etc.

It has been discovered that this class of fibers can be dyed well in acid dyebaths with the aforementioned classes of dyestuffs by using the cuprous-ion technique. The best results reportedly are obtained when the cuprous ions are formed *in situ* in the dyebath by reaction of a cupric compound and a reducing agent in the bath before the dye is added. The reducing agent may require acid or alkaline media, but the dyeing process itself is carried out in the acid region, ie, at pH values between 2 and 7. This method is *specifically for acrylonitrile homo- or copolymers;* it is not effective for dyeing cellulosic-base fibers or copolymers of vinyl chloride-acetate.

The goods are first scoured in an aqueous solution of a detergent and then treated with a cationic or non-ionic agent, such as Peregal OK (USPat 2,214,352), and a swelling agent that is usually insoluble or only slightly soluble in water, eg, o-, m- or p-phenylphenol, biphenol or similar products. The swelling agents are added in the form of their water-soluble alkali compounds, or they can be omitted entirely when medium or light shades are required or when certain water-soluble acetate dyes are used. The textiles are agitated in this bath for five minutes or more, then adjusted to the pH of 2-7 (preferably 2-4.5) by acidification. Thereupon the cupric salt and a suitable reducing agent, such as a metal formaldehyde-sulfoxylate, are added and well distributed in the liquid. Finally the dye is added and the bath brought to the boil. After 15-90 min the dyed material is soaped at 140° F, air dried and optionally relustered by briefly heating to 240-250 F.

Reducing agents requiring alkaline conditions, such as dextrose or glyoxal, have to be added to the cupric salt bath before acidification.

Example: A yarn spun from an acrylonitrile — vinyl chloride copolymer is scoured in a detergent, then immersed for 10 min in a treating bath containing 3% of sodium p-phenyl phenoxide, 3% of acetic acid, 1% of cupric sulfate and 0.4% of zinc formaldehydesulfoxylate. 5% of the acid dye Cloth Red G (*CI* 249) is added and the bath temperature raised to 212° F. After 90 min the dyed yarn is scoured and dried for 15 min at 248° F. A uniform red shade with good wash and crockfastness is obtained.

Other examples refer to the application of some specific acid and direct dyes, where the swelling agent can be omitted. Substitution of copper with Fe, Sn or Zn does not give a similar effect, as proved by a comparative table. The depth of shade is measured in a photoelectric reflection meter, the darker color corresponding to the lowest light reflectance. A great number of particularly suitable acid, direct and water-soluble disperse dyes is indicated in col 9 of the specification.

Among the references cited by the Patent Office:

Am Dyestuff Reptr of Jan 21, 1952, P39-43 (Blaker, Laucius) refers to the cuprous-ion technique as applied to Orlon acrylic fibers. Several reducing agents are discussed; hydroxylamine sulfate is reported to be particularly useful.

Rayon Synthetic Textiles of Oct 1950, p 84 and 91: dyeing of Dynel (vinyl-acrylic fibers) with disperse, acid and vat dyes proved to be satisfactory when the cuprous-ion technique and a swelling agent (p-phenylphenol) are used.

DYEING POLYACRYLONITRILE FIBERS———Cuprous Compounds Slowly Added C,4,07

USPat 2,743,992 (Union Carbide & Carbon Corp——Schoonover, Field Jr, Purse——May 1, 1956)

The current patent, referring to the same inventors' USPat 2,743,991, states that some advantages have been noticed in the application of the cuprous-ion technique in dyeing practice. Imperfectly dyed material may, for instance, result from the use of an excess of cuprous compounds, causing a change during the dyeing operation into a finely divided red- or brown-colored powder, which deposits on the fiber's surface and gives erratic dyeings. Formation of copper oxide under the prevalent dyeing conditions, ie, at temperatures around 212° F, was found to be greatest. Not only for economic reasons but also because of the risks of non-uniformity and poor light- and crockfastness, this excess must be avoided.

These faulty results are corrected, according to the present invention, by starting the dyeing process in the substantial *absence of copper compounds,* raising the bath temperature to 200-212° F (but still below the critical temperature at which change of shape of the fibers might occur), slowly adding thereupon—preferably dropwise—the cuprous-ion-containing liquid to the hot dyebath until the desired depth of shade is attained, then discontinuing further additions of the cuprous salt solution. The Cu-containing liquid is prepared (preferably just before it is added to the dyebath) by mixing cupric salt (aceate, sulfate, sulfite, formate, chloride) solutions with reducing agents, such as sulfoxylates, hydroxylamine sulfate, bisulfite, dihydrazine sulfate, glycol, etc, to avoid premature retransformation into cupric compounds. Otherwise the current specification refers, like USPat 2,743,991, to dyeing with acid, direct and water-soluble disperse dyes in acid solutions of a pH between 2 and 7.

Example: Staple fibers made from an acrylonitrile-vinyl chloride copolymer were scoured in a detergent, then introduced into a bath containing 4% of Xylene Milling Blue GL (*CI* 883), 3% of sodium phenylphenoxide as a penetrating agent, and 1% of Peregal OK as a leveling agent. The pH was adjusted to 4-5 with sulfuric acid. After the dyebath was heated to the boil, dyeing was continued for 30 min. Thereupon an aqueous liquid containing cuprous ions was added dropwise over 30 min. This liquid had been prepared by mixing a 0.25% copper sulfate solution with a 0.125 zinc formaldehydesulfoxylate solution. Dyeing was interrupted when the desired shade was attained. The dyed yarns were scoured and dried at 250° F.

References cited by the Patent Office:

"Chemistry of Synthetic Dyes" by Venkataraman, vol 2, 812-15, 1952 (Acad Press) describes the manufac-

ture of water-soluble anthraquinone dyes (Solacet) particularly by sulfonation or by introduction of other solubilizing groups; the dyes are used for dyeing cellulose acetate or nylon.

Brit Rayon & Silk J, 77 (Feb, 1954): abstract of a study by Happe and Hensel in *Zellwolle*, #12 (1953) explaining the specific effect of cuprous ions in the dyeing technique by possible intermediate formation of nitrilium compounds. R-C≡NH+ . . . recently discovered by one of the authors (Happe).

Tech Bull (*du Pont*) 7, #1, 45-52 (March, 1951) discusses the cuprous-ion technique in the dyeing of Orlon acrylic fiber with acid dyes; reports on dyeing procedure, carriers, fastness properties, and absorption; and gives a list of suitable acid dyes. Application of this method on acetate or vat dyes was found to have little effect.

An article by Field, Jr in *Rayon Synthetic Textiles* of Dec 1951 (62-63) discusses the dyeing of wool-Dynel blends with mixtures of Anthraquinone Blue SWF, Eastman Fast Red GLF and Eastman Fast Yellow 4RLF according to the cuprous-ion technique, using cupric sulfate and zinc formaldehydesulfoxylate.

CUPROUS-ION TECHNIQUE IN DYEING POLYACRYLONITRILES

———Water-Soluble and Water-Disperible Acetate Dyes Combined C,4,07

USPat 2,743,993 (Union Carbide & Carbon Corp ——Rankin——May 1, 1956)

USPatents 2,743,991 and 2,743,992 cover cuprous-ion dyeing methods for acrylonitrile homopolymer or copolymer fibers with acid, direct and water-soluble disperse (acetate) dyes. The class of *water-dispersible* disperse dyes could not be applied hitherto according to the same technique because these dyes seem to react chemically with the copper compounds, forming scum in the dyebath, thus precluding their use in the dyeing of polyacrylonitrile fibers. On the other hand water-dispersible dyes often possess outstanding lightfastness, superior to that of other groups.

The inventor discovered that water-dispersible disperse dyes can be used according to the cuprous-ion technique when applied *in conjunction* with water-soluble dyes of the class of acid, direct or water-soluble acetate dyes. The advantage is in the production of uniform dyeings of good washfastness *and* excellent light fastness on acrylonitrile fiber material. Mixtures of the dispersible and water-soluble dyes, as applied by the current process, are said to be particularly effective where heavy shades with excellent wash- and lightfastness are required.

The scoured fibers are introduced into a dyebath containing a dispersing and/or a swelling and penetrating agent (such as those mentioned in USPats 2,743,991-2 and a mixture of the dispersible and water-soluble dyes. Temperature is slowly raised to at least 175° F and preferably to the boil. After about 30 min the pH is adjusted to 2-7 (preferably to 6), and the dyebath is further heated for 15 min, whereupon the cuprous salt solution is gradually added as outlined in the digest to USPat 2,-743,992.

Example: Staple fiber material, spun from a copolymer of acrylonitrile and vinylchloride, was first scoured in an aqueous detergent, then treated in a bath containing 1% of sodium hexametaphosphate and 2% of Naccononol NR plus 6% of Anthraquinone Blue SWF 150%, 4% of Eastman Fast Yellow 4RLF and 2% of Eastman Fast GF (the latter two brands are of the water-dispersible class). The temperature was raised to the boil. After 30 min sulfuric acid was added to bring the pH to 6, and after another 15 min a cuprous-ion-containing solution was introduced dropwise (see USPat 2,743,992). Dyeing was continued for 30 min, after which anhydrous sodium sulfate was added. After another 30 min the dyed fibers were scoured and air dried at 160° F for 60 min. A full navy blue showing good wash- and crockfastness resulted.

Eight water-dispersible acetate dyes are listed as being useful in combination with the acid, direct and water-soluble acetate dyes mentioned in USPat 2,743,991-2.

Reference: same as those cited by the Patent Office to USP 2,743,992.

PASTING FABRICS ON SCREEN PRINTING TABLES——— High Alkyl-Methacrylates Used D,4

USPat 2,719,101 (Lankro Chemicals Ltd—— Koebner——Sept 27, 1955)

The usual method for fixing fabrics on a screen-printing table calls for distributing a gum solution evenly over the rubber or leather cloth, then rolling on the goods to be printed and pressing against the table's surface. One of the drawbacks in this procedure is that the printing pastes, in penetrating the cloth, soil the adhesive layer with color, thus requiring washing the table after each printing operation. Also "through prints" showing the same shade on both sides of the fabric are difficult to obtain because the color passing through the cloth to the nonprinted side will be partly adsorbed by the adhesive.

This problem reportedly has been solved by employing water-repellent methacrylic acid polymers dissolved in organic solvents instead of water-soluble gums as adhesives for pasting on the fabrics. Since these polymers remain tacky during several printing operations, the adhesive coating does not have to be frequently renewed. No soiling of the adhesive occurs, therefore the color is completely retained and utilized by the fabric, allowing perfect "through prints." Moreover, washing of the table becomes easier.

According to the examples, benzoylperoxide (catalyst) is added to a benzene solution of 2-ethyl-hexyl methcrylate or to a mixture of n-hexylmethacrylate and methylacrylate until the desired viscosity is obtained. A coating with this solution, applied to the surface of the printing table, dries to a durably tacky layer.

Among the references cited by the Patent Office:

USPat 1,982,946 (Ch Lenning/1934): adhesive substances comprising polymeric acrylic esters.

USPat 2,387,984 (Eddy——Striker/1945): screen-printing table to which a waxy adhesive (described as a non-aqueous, permanently slightly sticky substance) is applied in melted state.

USPat 2,583,286 (Albini-Colombo/1952): a paper prepared with insoluble glue and fat-modified resins and printed with any textile printing paste serves as a carrier for transferring the pattern to a textile fabric by calendering [cf *Am Dyestuff Reptr 41*, 415 (1952)].

DYEING GLASS FIBERS——— Anthraquinoid Vat Dyes on Substrate of Thermoplastic Resins C,4,07

USPat 2,722,488 (Gen Aniline——Lawsberg—— Nov 1, 1955)

The difficulties encountered in the dyeing of glass fibers are well known. The number of shades obtainable by customary processes is limited and the resulting fabrics are of inferior quality particularly with respect to their crock fastness.

A solution of this problem, suggested in the current patent, comprises the application of anthraquinone vat dyes on fibers previously prepared with the reaction product of a water-soluble maleic anhydride-vinyl copolymer (vinyl methyl or vinyl ethyl ether, vinylacetate) with a water-soluble resinous polyhydroxy compound, preferably polyvinyl alcohol. Other polyhydroxy compounds suitable for use as the second component include hydroxyethylcellulose or other water-soluble cellulose derivatives.

These resinous water-soluble reaction products are applied to the fiber from a solution adjusted to pH 2-4.5 and insolubilized upon drying at 212-600°, preferably at 300-500° F. The pretreated fabric is padded in a dispersion of an anthraquinoid vat dye in the oxidized form (keto form) or alkaline anthrol form and finally dried. According to one of the examples, the dispersed vat dye pigment may also be mixed directly with the aqueous resin solution, applied to the fabric, dried and cured.

An alternative procedure, protected by USPat 2,722,489 (Gen Aniline—Hennessey and Choquette) refers to an analogous process wherein the vat is applied to the resin-pretreated fiber in leuco acid form (acid vat) and oxidized to the insoluble vat dye. Another optional pretreatment of the glass fabrics in alkaline solutions at elevated temperatures is within the scope of the invention.

Example: A cleaned glass fabric is padded in a one percent aqueous solution containing polyvinyl alcohol and a water-soluble copolymer of maleic anhydride and methyl vinyl ether at 140° F, dried and heated to 300° F for about 1-30 min. The resin is converted in this phase into the insoluble state. Then the fabric is padded in an aqueous dispersion of Indanthrene Brilliant Green BN Double Paste (*CI* 1101) and air dried at room or higher temperatures. Optionally the fabric may be aftertreated with dichromate-acetic acid. (In this event it can be assumed that the dyestuff dispersion contains the alkaline-reduced product). The dyeings reportedly are fast to crocking and drycleaning, exhibiting also excellent light fastness.

Among the references cited by the Patent Office:

USPat 2,609,350 (Gen Aniline/1952): a textile size consisting of a solution of polyvinyl alcohol and a copolymer of maleic anhydride and vinyl derivatives [cf *Am Dyestuff Reptr 42,* 263 (1935)].

USPat 2,645,553 (Gen Aniline/1953): dyeing of glass fibers pretreated with an aqueous alkaline solution containing lignin sulfonic acid; the dyestuffs applied do not require chemical reduction [cf *Am Dyestuff Reptr 42,* 891 (1953)].

Brit Pat 559,329 (Bleachers Assoc Ltd/1944): coloring of glass fibers by first covering the threads with a resin precondensate, preferably one of the urea-formaldehyde type, drying, curing and dyeing with products of various classes.

Brit Pat 650,682 (Ciba/1951): glass fibers prepared with polyvinyl emulsions acquire affinity for different classes of dyestuffs, particularly for disperse and basic dyes.

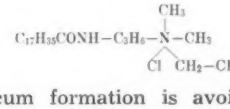
DYEING WITH METAL-COMPLEX AZO DYES———

High-substituted Quaternary Compounds Added C,4,06

USPat 2,723,178 (Am Cyanamid Co——Mooradian, Millson——Nov 8, 1955)

Metallized dyes used on animal fibers require relatively high amounts of sulfuric acid, which may impair the tensile strength of the material. The preamble to the current patent describes these dyebaths "as a compromise between *increasing* the acid, temperature and bath times to improve the dyeing and *decreasing* these factors to avoid excessive damage to the fabrics". Difficulties in this procedure are caused predominantly by slow penetration. This can be improved substantially by adding cation-active agents to the dyebath, but in this event a great disadvantage is encountered in the formation of *colored scum.*

The inventors have discovered a new class of quaternary compounds which do not form objectionable scum in dyeing. The products covered by the present patent are characterized by a long-chain *amido-alkyl substituent;* a preferred example is stearamido - propyl - dimethyl - hydroxyethyl ammonium chloride:



Scum formation is avoided when this or similar compounds are used. Assistants of this constitution can be added to the dyebath in substantial amounts without causing precipitation even in the presence of salts. A great advantage is seen in that these agents cause the dye to migrate, in the case of locally overdyed portions, to the fibers deficient in color. They may be added in small portions to the dyebath at any time, permitting complete control of the dyeing process.

The specification refers to the inventors' USPat 2,470,080 (1949), assigned to the same Company, which describes the use of an alkylolamide of a thermally polymerized drying oil acid, such as dimerized cotton seed oil, condensed with alkylene oxide. Assistants of this type are levelling agents for metallized azo dyeings of nonionic character. The quaternary compounds of the current invention (in contrast to the nonionic agents) permit the replacement of sulfuric acid in the dyeing process with organic acids, at the same time reducing the dyeing time and diminishing fiber attack. Because of the strong migratory properties, highly twisted yarns can be dyed with good results.

Example: A dyebath was made up with chromium complex azo dyestuff, ammonium sulfate and Glauber's salt to which a solution of the aforementioned quaternary compound had been added. Wool was dyed in this bath for about 30 min at the boil, then acetic acid was added and boiling was continued until the dyeing was complete. A bright level dyeing resulted; whereas the control sample in which the assistant had been left out was inferior in shade, strength and levelness.

Among the references cited by the Patent Office:

USPat 2,003,928 and 2,019,124 (Imp Chem Ind/1935): stripping assistants consisting of higher amides or higher amine salts, the aliphatic chain containing 10 C or more ("Lissolamines"?).

USPat 2,040,796 (Gen Aniline/1936): dyeing of animal fibers with metal complex azo dyes with reduced amounts of sulfuric acid in the presence of a protective colloid, such as glue, a polyglycolether of wool fat alcohols, of oleylalcohol, ricinoleic acid, etc.

Brit Pat 436,863 (Ciba/1935): dyeing of animal fibers with metal complex azo dyes in the presence of a salt of an organic base or the corresponding quaternary compounds, for instance, the hydrochloride of dioxypropyl imidazole, optionally quarternized.

WATER REPELLENT FINISHES ———Organosilicone-Titanium Esters Copolymers G,2,02

USPat 2,716,656 (Monsanto Chem Co——Boyd ——Aug 30, 1955)

The preamble to this patent points to the difficulty in incorporating polymers of carbon compounds into organosilicon polymers, mainly by reason of the incompatibility of the components. The object of the current method is to copolymerize organic titanium compounds with organosilicones. Copolymers of this type particularly have to be used to render fibers water repellent. The repellency was found to be about 100% even after a 24-hr immersion in water or after repeated laundering or drycleaning. Moreover these copolymers are claimed to be efficient catalysts in curing urea-, phenol-, or melamine-formaldehyde precondensates.

The silicon compounds are products of the general formula:

$Si(OR)_nR_{4-n}$ wherein "R" is any monovalent hydrocarbon group, such as alkyl, aralkyl, etc. All "R"s may be different or have the same signification. An example is dibutoxy dibutyl silane.

Titanium compounds to be used in this process may include orthotitanic esters, such as tetrabutyl orthotitanate . . . $Ti(OC_4H_9)_4$, also tetra amides or tetra anhydrides of titanium.

The two components are reacted in the form of their monomers in an anhydrous solvent while some water (generally mixed with an organic solvent) is slowly added to effect copolymerization. Final copolymers range from liquids to hard solids, depending on the amount of water added. 0.1 mols water per one mol monomeric mixture will produce relatively low molecular substances, while the addition of one to 1.5 mols water causes cross-linking and produces solids.

No example for the application of these copolymers in water-repellent processes is presented in the specification.

Reference cited by the Patent Office:

USPat 2,512,058 (Du Pont/1950): reacting one organo silicon oxy compound obtained by the hydrolyzing of chlorosilanes with an organic titanate, eg, tetraethyl titanate, resulting in resins suitable for producing films and paint vehicles.

PIGMENT PRINTING EMULSION ———Ethyleneimine or Isocyanate Derivatives as Cross-linking Agents D,2,07

USPat 2,719,831 (Bad Anilin— & Sodafabrik ——Craemer, Hoelscher——Oct 4, 1955)

The use of precondensates of thermosetting resins combined with dispersions or solutions of polymers or copolymers as binders in pigment printing pastes is known. The precondensates are finally insolubilized by the application of acids or acid-reacting substances.

The present invention comprises the application of similar mixtures, ie, a) aqueous solutions or dispersions of organic polymers and b) thermosetting precondensates together with c) cross-linking agents, specifically characterized as compounds containing two or more ethyleneimine or isocyanate groups. It is assumed that "c" reacts not only with compounds of group "a" but also with those of "b", reportedly giving prints of high fastness to water and crocking even when temperatures below the hardening point of the thermosetting components are used.

ad (a): Organic water-soluble or water-dispersible polymers have to contain reactive hydrogen atoms, for instance, polyvinylalcohols, acrylic acid or acrylic acid amide polymers, etc. According to the claims, substances of this group form the greater part and compounds of group "b" the minor part of the composition.

ad (b): Precondensates of the aldehyde type carrying methylol groups, optionally etherified, are preferred.

ad (c): Cross-linking agents, termed polyfunctional compounds, are, for instance, ethylene imides of polybasic acids, such as the reaction product of 2 mols ethyleneimine with one mol of disulfochlorides of aliphatic chains, or adducts of diisocyanates and malonic acid esters. Adding to "c" acid condensing agents, as used in the prior art, is within the scope of the patent.

It is especially useful to add also an emulsion of an organic solvent of bp 75-220°C to the aqueous mixture of "a" and "b".

Example: A copper phthalocyanine paste (20%) plus some ammonia is dispersed in gum tragacanth thickener. An aqueous dispersion of acrylic acid butylester, vinyl chloride and acrylic amide polymer (a) and tetramethylol urea (b) plus the reaction product of a disulfochloride of an aliphatic hydrocarbon (8-18 C chain length) with 2 mols ethylene imine (c) are emulsified in the above pigment emulsion. A fabric printed with this paste is dried at 70-90°C and heated for a few minutes to 100-180°C.

Among the references cited by the Patent Office:

USPat 2,643,958 (Farbenfabr Bayer/1953): printing pastes containing resinous polyamines and cross-linking agents, such as diisocyanates, diacrylamides, triacrylyl triazine, etc [cf *Am Dyestuff Reptr 43*, 17 (1954)].

USPat 2,558,053 (Interchem/1951): emulsion printing pastes comprising a pigmented dispersion of a solid polyethylene in a solution of a thermosetting amine- or phenol aldehyde resin.

USPat 2,536,050 (Am Cyanamid/1951): textile finish devised from a thermoplastic resin polymer and a curable melamine-aldehyde resin.

USPat 2,430,479 (Du Pont/1947): bonding of laminates, particularly cellulose and synthetic rubber polymers, by cross-linking with polyisocyanates or polyisothiocyanates.

USPat 2,374,602 (Am Cyanamid/1945): textile printing emulsions of the water-in-oil type containing in the oily phase a water-insoluble, solvent-soluble, heat-convertible resin (modified alkyd resin, butylated methylolurea) dissolved in a volatile, predominantly nonaromatic solvent.

USPat 2,275,991 (Rohm & Haas/1942): printing paste comprising a water-insoluble pigment and a water-dispersible thickener (gum, alginate, sodium polyacrylate) wherein a resin polymer, such as a polymerized acrylic or methacrylic ester, is emulsified.

PIGMENT PRINTING EMULSIONS———Specific Polymers plus Thermosetting Precondensates D,2,07

USPat 2,719,832 (Bad Anilin— & Sodafabrik ——Craemer, Hoelscher——Oct 4, 1955)

The introduction to this patent refers to the content of USPat 2,719,831, granted to the same inventors (see preceding digest). Both patents have in common the fact that mixtures of thermoplastic copolymers and thermosetting-resin precondensates must be used as pigment carriers in printing, dyeing and coating.

The difference between the two patents is that USPat 2,719,832 protects a composition containing aqueous dispersions of polymers having *both halogen and amido groups* (a) plus a thermosetting resin precondensate (b), while cross-linking agents of the type described in USPat 2,719,831 [sub "c"] are omitted. Instead, hardening agents, such as inorganic or organic acids or ammonium salts of strong acids, must be employed.

ad (a): Copolymers of this group are, for instance, those obtained from vinylchloride and acrylic acid amide; or from acrylic acid chloroethylesters and methacrylic amide and so on. Also mixtures of polymers in which one of them contains the halogen, the other, the amido group, can be used. An example of the latter is a mixture of a copolymer of asymm dichloroethylene and acrylonitrile plus a mixture of an acrylic acid amide copolymerized with acrylic acid ethylester.

ad (b): Thermosetting precondensates are of the same type as described in sub "b" in USPat 2,719,831. Also here, components of group "a" are in excess of those mentioned in "b".

The mixtures of "a" and "b" are applied in the aqueous phase of the emulsion. An oil-in-water emulsion of volatile organic solvents may also be added.

Example: The outer (aqueous) phase consists of a dispersion of asymm dichloroethylene, butyl acrylate and acrylamide (b) together with ammonia, tragacanth thickener and an aqueous solution of dimethylol-1-4-butane diol diurethane, and ammonium nitrate as a curing agent (b). The inner phase comprises test benzine. Copper phthalocyanine is dispersed in this emulsion. Fabrics printed with the paste are dried and heated to 130-140°C for 6-16 min. A soft print extremely fast to rubbing and washing reportedly is obtained.

One of the examples refers to an analogous pad-dyeing process.

Reference cited by the Patent Office:

USPat 2,600,681 (Monsanto Chem Co/1952).

Abstracts

The Procion Dyes

Anon, Dyer 116, 423-4, September 14, 1956.

The Procion dyes, developed by Imperial Chemical Industries, are said to be the first to be introduced to the dyeing and printing trade that achieve their high wet fastness by formation of a chemical bond between dye and fiber.

The reaction between the Procion dyes and cellulosic fibers proceeds rapidly under alkaline conditions, and this fact enables them to be applied by a *cold* dyeing technique in conventional dyeing machinery.

The low physical affinity and high aqueous solubility of these dyes renders them particularly suitable for continuous application with freedom from "tailing", especially when applied by a new pad/dry technique that has been developed for their use.

Dyeings on cotton, rayon and linen produced by the methods recommended by ICI are said to possess high fastness to washing, perspiration, soda boiling, wet and dry rubbing, and light, even in pale shades.

Instructions are given for applying the dyes to the cellulosic fibers by either continuous or batchwise techniques.

The new dyes, at present limited to only three colors (yellow, red and blue), may also be dyed on nylon staple fiber, and have the advantage over vat dyes of being easier to apply.

In printing on cellulosic fibers, urea and sodium bicarbonate are added to the paste, with sodium alginate as thickener. A short steaming completes the fixation. The dyes may be printed alongside Indigosols by the use of an appropriate recipe, and alongside Rapidogens if neutral steam is used.

The dyes may also be printed on chlorinated wool and natural silk, but are not recommended for printing on nylon, acetate, triacetate, Orlon or Terylene.—WHC

Effects of Temperature on Sizing

"Technical Correspondent", *Textile Mfr* 82, 470-3, September, 1956.

From the cooking of all types of size mixtures to the drying of sized warps, the effects of variation in temperature are very marked. Quality of product, together with efficient and economic working, can only result from a proper understanding of the role that temperature control can play as a main factor in the sizing of all classes of warp in preparation for weaving.

The temperature at which maximum viscosity is obtained varies with different starches (potato 150-160°F; corn, 160-170°; wheat and rice, over 170°). The starch should be cooked until a uniform consistency is obtained, and high agitation is desired. Starch pastes should not be kept overnight unless they are prevented from cooling.

Temperature control is recommended highly both in the cooking kettles and on the slasher itself, in the interests of uniformity of product. A modern method of producing uniform sizes is by means of the homogenizer, with notable fuel saving and a much more uniform size consistency.

It is generally agreed that a high temperature in slashing (eg, using a more concentrated size at 200-205°F) is desirable rather than a lower temperature (eg, using a less concentrated size of the same viscosity at 170°F).

The author describes the preparation of gelatine and casein sizes, and cautions against the overheating of gelatine size (above 160°F).

In sizing viscose warps a size temperature of 130-140°F is recommended; for acetate, 160-165° is better. Drying temperatures for viscose should not exceed 220°F; for acetate, 200°. The author quotes various authorities in regard to the proper techniques for sizing these two fibers.

Air dryers for slashers are claimed to be better than cylinders, since they yield a more rounded and less over-dried yarn.

Thirteen references to the literature are cited.—WHC

Nonwoven Fabrics: A New Textile Material

Coke, C E, *Can Textile J* 73, 51-5, June 29, 1956.

The author reviews the growth of the nonwoven fabrics industry from a few thousand pounds in the US in 1945 to 25 million pounds in 1953 and an estimated 50 to 75 million in 1955.

Nonwoven fabrics (known in the United Kingdom as "bonded fiber fabrics") were originally made largely from waste cotton, but have since been improved by the introduction of viscose, either alone or in blends with cotton. This scope has been further widened by the use of a nylon blend.

The bonding of a web of fibers is accomplished either by using thermoplastic fibers and subjecting the web to heat alone or to a solvent, followed by heat, or by applying to the web a liquid bonding agent, followed by drying and curing if necessary.

Beginning in 1952, a new type of nonwoven fabric appeared, known as "Pellon", in which the bonding agent was a nitrile rubber formulation. This fabric is said to have excellent resilience to crushing, moderately good strength, and high tear resistance.

A table is included, giving the physical data of a large number of representative nonwoven fabrics from eight well-known American manufacturers. These data show that a wide range of physical properties is attainable, thus permitting nonwovens to be engineered to specific end use requirements.

One important end use for these new textiles is said to be the reinforcement of vinyl sheeting used in the automotive trade. The writer also mentions other uses (eg, window drapes and bath mats), and anticipates that they will eventually find employment in dress fabrics.

Colored nonwoven fabrics can be produced by incorporating colored pigments in the bonding agent, by dyeing the bonded web, or by the use of dope-dyed fibers.

Eleven references to the literature are cited.—WHC

Shrink-Resisting Wool: Some Novel Features and the Description of a New Process

Davidson, A N and Preston, R, *J Textile Inst* 47, P685-P703, August, 1956.

Generally the shrinkage of wool fabrics is caused either by the relaxation of finishing strains or by the felting or matting together of the fibers when wool in any form is submitted to a series of alternate compressions and relaxations, especially in the presence of water, acids or alkalis.

The authors briefly refer to the various methods that have been used in the past to produce shrink-resisting wool goods, as follows:

1) Treatment with chlorine and related compounds.
2) Treatment with binary or ternary mixtures of nonaqueous solvents and alkalis.
3) Treatment with enzymes.
4) Other treatments (hydrogen peroxide, sodium chlorite, and resins).

The authors point out that for a really satisfactory result there must be cooperation between the manufacturer of the goods and the finisher.

They mention the increasing use of other fibers (nylon, Terylene, Orlon, cotton, etc) in blends with wool, and discuss the possible adverse effect of the shrink-resist finishes on these fibers.

Most shrink-resist finishes, when applied under controlled conditions, do not modify wool chemically to any appreciable extent. Over-treatment results in a partial conversion of disulfide sulfur into cysteic acid, and in an increased solubility of the wool in alkaline and acid solutions. In the methods using solutions of chlorine or hypochlorous acid, care must be taken to ensure that the solution is maintained at pH 5 or below, otherwise yellowing of the fibers occurs which cannot be removed even by bleaching.

The authors describe in much detail a series of new experiments performed with peracetic acid as a pretreatment of the wool, followed by 1) treatment with papain, 2) treatment with hypochlorite. It was found that both papain and chlorine under these conditions make wool fabrics satisfactorily resistant to felting. The best results were obtained with peracetic acid at a pH of 3. A subsequent treatment with sodium bisulfite improves the white.

The authors point out the advantages of this new method, for which they have applied for patent protection.

Twenty-nine references to the literature are cited.—WHC

Dyeing of Dacron Polyester Fiber Using Carriers

Landerl, H P, *Tech Bull (du Pont)* **12**, 81-90, June, 1956.

Dacron is dyed commercially under high-temperature conditions such as those obtained in pressurized equipment, or with the aid of carriers in equipment operated at atmospheric pressure. Carriers are dyeing assistants which increase the rate of penetration of the disperse dyes into the Dacron fibers. A wide variety of aromatic compounds can be used as carriers. Some of the materials which have been used commercially are benzoic acid, salicylic acid, phenol, o-phenylphenol, p-phenylphenol, cresol, biphenyl, acetophenone, phenylmethylcarbinol, mono- and polychlorinated benzenes, and methyl salicylate. Many of these are available as proprietary products, in which form they are generally combined with dispersing or emulsifying agents.

To help in selecting the proper carrier for a particular job, the author lists the advantages and disadvantages of each type, and includes cost comparisons.

As to which carrier should be used, the following suggestions are offered:

Mills making carrier dyeings on a daily basis should use one of the less expensive nontoxic types such as "Dowicide A" in every dyeing possible. While this carrier can cause spots, many mills have learned how to handle it successfully, according to the author.

Mills making occasional carrier dyeings, where personnel is not too familiar with handling carriers, should use a foolproof type such as "Latyl Carrier A". The elimination of redyes caused by spotting can soon overcome the additional cost of carrier.

Detailed procedures for dyeing Dacron with these two carriers are given by the author.

Blends of Dacron and wool are being dyed with disperse dyes for the Dacron, using Dowicide A as carrier, and with acid dyes, premetallized acid and neutral dyes, and chrome dyes for the wool. Both one- and two-bath methods of dyeing these blends are described.

Blends of Dacron and cellulosic fibers are dyed with selected disperse dyes for the Dacron, using o-phenylphenol as carrier, and direct dyes for the cellulosic fiber.

Blends or mixtures of Dacron and nylon can be dyed by both one- and two-bath methods. The Dacron is dyed with selected disperse dyes from a carrier bath and the nylon is dyed with acid or premetallized dyes from the same bath or from a fresh bath.

Blends of Dacron and Arnel may be dyed in union shades by using selected disperse dyes, with either Latyl Carrier A or Dowicide A.

Seven references to the literature are cited.—WHC

Moth and Mothproofing Agents

Mukherjea, R N, *Colourage* **3**, 17-22, September, 1956.

The author briefly discusses the various types of wool-eating moths and the historical background of attempts to protect wool from moth attack.

The first mothproofing agent marketed was aluminum ammonium fluoride, but this, while giving considerable protection, had no wet fastness and is now seldom used.

Eulan RHF was next brought out. This could be applied to wool from an acid dyebath, but was also not resistant to washing. Eulan N and CN, however, have all-round fastness comparable with acid dyes, combined with ease of application. A later brand, Eulan FLE, is said to have "all the essential characteristics" of a good mothproofing agent.

Still other good moth preventives are Mitin FF, Eulan NK and BL, and Bional A. The chemical constitutions of all of these products are given and their biological action on the moths is described. Mitin appears to act as a poison, while Eulan makes the fiber unpalatable and the larvae die of starvation.

It is also possible to moth-proof wool by modifying the sulfur linkage in the fiber molecule.

Five references to the literature are cited.—WHC

Tendering in Scouring and Bleaching Cotton Piece Goods

Technical Correspondent, *Textile Mfr* **82**, 313-15, June, 1956.

Two causes of tendering in scouring and bleaching cellulosic fibers are the formation of oxycellulose by excessive oxidation, and the formation of hydrocellulose in the presence of excess mineral acid.

The author discusses the occurrence of tendering in the various operations of bleaching cotton cloth.

In the singeing operation, preservatives such as magnesium or zinc chloride in the warp size may liberate hydrochloric acid, which weakens the fabric.

If a mineral acid is used for the grey sour and any portion of the cloth becomes dried-out, there is a risk of tendering. The same is true if the acid is not completely removed by rinsing.

In the kier-boil, formation of oxycellulose may result from air drawn into the kier, or from the use of a short liquor insufficient to cover the cloth.

In hypochlorite bleaching, the author states that the chlorine first reacts with the dark brown protein matter in the cotton, forming light yellow protein-chloramines; this is gradually followed by bleaching to a full white. If any protein-chloramines are left in the goods by insufficient washing, tendering may result.

In the peroxide bleach, tendering can be avoided by strict control of the pH of the bath and by avoidance of any iron or copper materials in the tank. Also a thorough rinsing after bleaching is important. The stability of the bleach bath is improved by the addition of magnesium sulfate.

In bleaching rayon, wool, silk, etc, in comparatively small quantities, the use of sodium perborate is preferable to either sodium or hydrogen peroxide, according to the author, as the bleaching can be done in mildly acid solutions, and there is less danger of damage from iron stains in the fabric.

News of the Trade

Fletcher Opens New Showroom

The Centrifugal Division of The Fletcher Works, Philadelphia, Pa, officially opened its "retail-type" showroom for its complete line of centrifugals on Thursday, November 15th, and at the same time played host to over 1,000 executives of the chemicals, laundry, drycleaning, pharmaceuticals, food processing and metals industries at an open house.

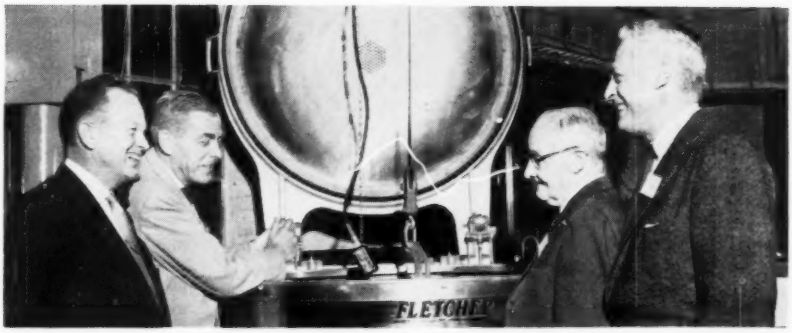
The entire engineering and executive sales staff of The Fletcher Works, one of the world's largest producers of centrifugals, under Edward T Taws, president, played host to visitors.

The new showroom, which comprises about 1,200 square feet of floor space, is showing Fletcher centrifugals which possible customers can operate themselves. It overlooks the machine shop at The Fletcher Works.

Adjacent to the new showroom, which is patterned after those used by automobile retailers, is Fletcher's testing laboratory where company customers can have materials run through complete pilot tests. During the open house, Fletcher chemists and engineers ran tests for visitors.

On the floor of the Centrifugal Division showroom are:

A 48-inch "Flow Clean" stainless steel washer-extractor; 40-inch and 48-inch Fletcher "Whirlwind" extractors; "Twintainer" stainless steel 50-inch, 54-inch and 60-inch automatic extractors, each with overhead jib boom and electric hoist; the 30-inch and 33-inch "Junior" extractor; the 30-inch "Standard" extractor; the "Chip-Wringer," which de-oils metal chips and turnings (comes in 20, 26, 40 and 48-inch bowl sizes); the 12-inch stainless steel laboratory centrifugal model for pilot studies; and a 24-inch direct-connected suspended centrifugal, which generally is custom-made for each customer.



Heads of The Philadelphia Textile Institute William H Hughes, head of the Chemistry Dept, Richard S Cox, dean emeritus, and Bertrand Hayward, president, study the new Fletcher "Twintainer" extractor in the newly opened Fletcher Works Centrifugal Division showroom in Philadelphia. On the left is Edward T Taws, Fletcher president.

FIT Construction Contract Awarded

The contract for the sum of $8,900,000 for the construction of the new Fashion Institute of Technology building was awarded to the Depot Construction Co on Thursday, December 20, at 3:00 pm, in the office of the President of the Board of Education, 110 Livingston Street, Brooklyn. Representatives of the college, state and the city were present at the ceremonies.

1957 KAE

The 1957 Knitting Arts Exhibition will be held in Atlantic City, April 29-May 3, 1957.

More than 200 firms are expected to exhibit, with packaging developments for the point of sale promotion having an important role. New sewing, bleaching, washing and dyeing equipment will be an integral part of the show.

Althouse Gift to Dickinson

C Scott Althouse, president of the Althouse Chemical Company, has made a gift of $300,000 to Dickinson College for its development program.

William W Edel, Dickinson president, said the gift was specified for a new science building to cost $600,000. He said the college will seek to match Dr Althouse's contribution with support from alumni, industry and other sources. Groundbreaking for the building is scheduled for next June.

The donor, a Dickinson trustee, has made other gifts to the college. In 1951 Dr Althouse endowed a professorship in the department of chemistry which the college named for him in recognition of his achievements in the textile industry.

The new building will house the department of chemistry and possibly other science departments.

Dr Althouse's gift is the largest ever made to the 184-year-old liberal arts college by an individual in his lifetime, said George Shuman, Jr, financial vice-president and director of development.

Cook Machine Moves to Nashua

Cook Machine Co, Inc, formerly Cook P & N Machine Co, Inc, moved on December 15th to a new plant at Jackson Street, Nashua, NH (Mail address: P O Box #397).

The Company has stated that the expansion of facilities is designed to meet the increased demand for its products. At Nashua, it will have complete and modern fabricating and machine shops "with facilities to produce more machinery more economically, make faster deliveries and generally improve its services to the industry."

Cook Machine Co engineers, designs and manufactures a complete line of equipment for the bleaching, dyeing and finishing of textiles.

The principal officers of the Company are: Perce Cook, president; James Cook, vice president and treasurer; Walter K Shaw, secretary; Ernest M Cook, vice president and general manager; John M Stearns, chief engineer; and William Holm, plant superintendent.

PTI Foundation Purchases Additional Ground

The Philadelphia Textile Institute Foundation has purchased for the benefit of the Institute approximately four (4) acres of ground across from the PTI campus on the northwest corner of Henry Avenue and School House Lane.

This plot will allow for expansion of the campus facilities of the Institute, heretofore limited to the presently occupied twelve-acre site.

Pennsalt Completes Consolidation

The Pennsylvania Salt Manufacturing Company has completed the consolidation of its Sharples operations with the activities of the Industrial Chemicals Division. The new unit, known as the Industrial Division, will be directed by General Manager Hugh C Land.

Included in the fully integrated operations of the new division are plants at Natrona, Pa, Wyandotte and Riverview, Mich, Calvert City and Marion, Ky, and Houston, Texas. These units produce a variety of organic and inorganic chemicals for industrial use Distribution of these products is now handled by a combined sales organization serving the eastern, southern and central areas through 16 sales offices. Similar products for western markets are produced in the Tacoma and Portland plants of Pennsalt's Western Division.

"Two Hundred Years of Textile Designs"

The Scalamandré Museum of Textiles, 20 West 55th St, New York 19, NY, has announced the opening of a new exhibit to be shown during January, February and March.

The exhibit, entitled "Two Hundred Years of Textile Designs," shows the various periods and the styles of trimmings used in conjunction with them, ranging from the mid-17th through the mid-19th centuries. They form a comprehensive and kaleidoscopic exhibition of colorful silk textiles. The periods, during this interim of time, comprise those of France, England and America.

Lectures to schools, clubs and visiting groups will be given upon request. Arrangements for either day or evening lectures can be made by contacting the director, John Kent Tilton, of The Scalamandré Museum of Textiles.

The museum is open from 9:00 AM to 5:00 PM, Mondays through Fridays, and is free to all.

FRL Xmas Party Funds to Hungarian Relief

At a meeting of the entire staff of Fabric Research Laboratories, Inc, Dedham, Mass, early this month it was voted unanimously to cancel the annual Christmas party and contribute to the Hungarian Relief Fund the money usually spent on the party. Staff members at the Dedham Laboratories expressed the hope that other organizations would follow the suggestion made nation-wide over the Ed Sullivan television show.

Eligibility for *Felisol* Label

The following are eligible for membership in the International Association for the Fastness Label *Felisol* (cf page 711, Sept 19 issue of ADR):

a) Manufacturers of dyes which conform to the specifications laid down by the Association;

b) One national organization of finishers in each country incorporated for the purpose of promoting the aims of the Association, the members of the said organizations being entitled to use the certification mark in the manner stipulated by the regulations.

Membership has been granted to the following firms:

a) *Manufacturers of dyes*:
Badische Anilin-und Soda-Fabrik A G, Ludwigshafen a Rh
Farbenfabriken Bayer Aktiengesellschaft, Leverkusen
Cassella Farbwerke Mainkur Aktiengesellschaft, Frankfurt a M
Farbwerke Hoechst A G Frankfurt a M
Imperial Chemical Industries Ltd, Manchester
Compagnie Française de Matières Colorantes, Paris
Aziende Colori Nazionali Affini —ACNA, Milano
CIBA Aktiengesellschaft, Basel
Durand & Huguenin A G, Basel
J R Geigy A G, Basel
Rohner A G, Pratteln/Basel
Sandoz A G, Basel

b) *National organizations of finishers*:
Vereniging van de Nederlandse Echtheidsmerk Textielgoederen, *Hengelo* (Holland)
Associazione Italiana per il Marchio di Soliditá FELISOL, *Milano* (Italy)
Schweizerisches Markenpatronat FELISOL, *Zürich* (Switzerland)

Discussions are in progress with American dyemaking firms and with countries where new national organizations of finishers are to be founded.

Klopman Mills Establishes Scholarship at NC State

A four-year scholarship with a value of $500.00 per year has been established at the School of Textiles, North Carolina State College by Klopman Mills, Inc. The scholarship will be awarded to an employee or a son or daughter of an employee in any of the Klopman plants.

The purposes of the scholarship are to promote more interest in textiles, self development, and to offer financial assistance to those who desire higher educational training.

Ultrasonics Symposium

American industry will buy more ultrasonic equipment in 1957 than in all previous years, it was predicted last month at an ultrasonics symposium held at the Yale Club, New York, NY. However, the symposium was warned of "artificial barriers that threaten to slow future progress unless industry takes cooperative action now."

It was predicted that the market for industrial application of ultrasonics will undergo a three-fold expansion in the next twelve months.

The symposium, on "Ultrasonics—A New Tool for Industry," and practical ultrasonic demonstration was jointly sponsored by Acoustica Associates, Inc and by Mullard Ltd, one of Britain's largest electronics manufacturers, to describe their cooperative plans to speed ultrasonic development in industry.

The warning about threats to future progress came from Robert L Rod, president of Acoustica Associates, Inc, who said that users and manufacturers of ultrasonic equipment must cooperate to overcome three barriers: "lack of research among prospective users, lack of industry-wide quality standards, and unnecessary secrecy about new discoveries."

New ultrasonic discoveries from Britain soon will be made more readily available here as a result of official appointment of Acoustica Associates, Inc as national distributor of Mullard's ultrasonic devices made in England.

Acoustica revealed that it had stepped up production more than 175% at its plant in Glenwood Landing, NY, to meet demands for ultrasonics systems.

Other speakers at the symposium were Miguel Junger, of Cambridge Acoustical Associates and recently research fellow of the Harvard University Acoustics Laboratory, who spoke on research into the future of ultrasonics; E Joseph Porto, vice president of International Electronics Co (Mullard, Ltd products); and Paul M Platzman, symposium chairman and vice president of Acoustica Associates.

LTI Evening Div Offering Associate Degree Courses

Commencing with the present term, Lowell Technological Institute has been authorized to award associate degrees in engineering in its Evening Division. Programs have been established in eight areas. Most will require four years to complete, by attending classes three evenings a week for two 15-week terms each year.

Hagan Corp Changes Name

Hagan Corporation will change its name to Hagan Chemicals & Controls, Inc, effective January 1, 1957.

At the same time its subsidiaries, Calgon, Inc, Hall Laboratories, Inc and The Buromin Company will be merged into the parent company. Calgon and Hall will continue as divisions.

In announcing the change, W W Hopwood, Hagan president, said that the new name will better describe the company's activities in the fields of chemical engineering and automatic control equipment. The merger of the subsidiaries, he said, is expected to give the company some important tax advantages and operating economies.

Chem-nyle Process on Half-hose

More than 150 half-hose manufacturing people from over the South met in Greensboro, NC, on December 12 to hear and see details on the Chemstrand Corporation's Chem-nyle filament nylon dyeing process.

Walter H Hindle, associate director in charge of textile research for Chemstrand, described the techniques of dyeing nylon half-hose by the Chem-nyle Process, which was developed by a scientific team under Hindle's direction at Chemstrand's Research and Development Division in Decatur, Alabama.

Comparative samples of half-hose dyed by conventional processes and by the Chem-nyle Process were exhibited at the meeting in the Plantation Supper Club. Included were samples of brown, navy and black half-hose, which were washed at the boil with white goods with no indications of fading or color transfer. Other Chem-nyle-dyed fabrics were also displayed.

This marked the first time, Hindle said, that details of Chem-nyle dyeing of nylon half-hose have been presented. This was the third in a series of talks to technical groups, previous talks being on woven and tricot goods which are now being dyed commercially by the new process.

Hindle was assisted in the presentation by George A Poovey, Jr of Chemstrand's Research and Development Division and by members of the chemical textile fiber firm's Sales Division.

Hindle said that more than 100 dyeing and finishing companies in this country have already applied for licenses to use the Chem-nyle Process, which "provides a previously unmatched combination of dyeing uniformity and color-fastness worthy of the long lasting qualities of filament nylon yarn."

Foxboro Opens Instrument Service Shop in Atlanta

The opening of an instrument service shop in Atlanta for the convenience of industrial instrument users in the Southeast has been announced by The Foxboro Company, Foxboro, Mass. Initially, the new shop will handle emergency repair work on Foxboro instruments and will also serve as a parts and supplies depot. Facilities for repair of temperature instruments will be added in the near future.

The new shop, located at 3232 Roswell Road near Foxboro's Atlanta branch office, will serve instrument users in Mississippi, Alabama, Georgia, Florida, South Carolina, North Carolina, and parts of Tennessee. Its emergency repairs will supplement the work of Foxboro branch office service engineers who make regularly scheduled Service Agreement calls throughout the seven-state area.

Maynard S Batchelder, who joined Foxboro's Atlanta office in 1953 as a service engineer, has been appointed shop manager.

7th Materials Handling Exposition

The seventh national Materials Handling Exposition, the original show in this field established in 1947, will return to the East after a four-year interval, according to a recent announcement by Clapp & Poliak, Inc, New York, the exposition management. The show will be held at Convention Hall, Philadelphia, April 29 through May 3. The last show was held in Chicago two years ago.

Concurrently with the show, the American Material Handling Society, whose membership consists of executives of firms which use various types of materials handling equipment, will conduct an extensive conference to discuss new developments in handling methods. The society also will hold its annual banquet during the show period and will present its annual honors and awards at that time.

The show will be the broadest and most comprehensive ever undertaken in the field. More than 100 different types of materials handling equipment will be demonstrated.

Theme for the 1957 show will be "Materials Handling, Key to Automation." More than 180 companies already have reserved space for exhibits and the total is expected to exceed 250, according to Clapp & Poliak.

Advance registration cards may be obtained from Clapp & Poliak, Inc, 341 Madison Ave, New York 17, NY.

Industrial Textiles Market Week Exhibit Cancelled

Cancellation of the planned Industrial Textiles Market Week Exhibit was announced on December 13th by M J Lovell, director of the Industrial Textiles Council, Inc. Scheduled to have taken place at the New York Trade Show Building, New York, next May, the trade show was intended to be a demonstration of all of the Industrial Textiles Industry's products to the trade.

Cancellation of the Show was due to poor industry response. Mr Lovell stated that no specific plans had as yet been formulated, but indicated that the Industrial Textiles Council, Inc, would probably continue on as a trade association operation. He stated that he had received many representations to that effect from leading figures in the industry who indicated that there is a great need for trade association representation for industrial textiles.

Textile Industry Highlighted on "Press Conference"

The textile industry was highlighted on the television program, "Press Conference," Sunday, December 23. The program, sponsored by Corn Products Refining Company, is telecast on the ABC television network on Sundays at 8:30 pm EST.

The documentary-type commercial message cited the ways in which starches, gums and dextrines, all products of corn, are used in the manufacture of fabrics for suits and dresses, shirts, underwear, socks and handkerchiefs.

Also mentioned in the commercial was the development by Corn Products of zein, a corn protein, from which the textile industry has made an entirely new fabric which is soft and resilient like wool, with new suppleness and draping qualities.

"Press Conference" consists of interviews by a dozen top newsmen in Washington or New York with a noted personality in national or international fields on a topic currently in the news.

12th Purdue Industrial Waste Conference

The 12th Purdue Industrial Waste Conference will be held May 13-15, 1957 in the Purdue Memorial Union Building, Purdue University, Lafayette, Ind.

There will be approximately fifty papers presented on subjects dealing with industrial wastes and their treatment.

Hotel reservations may be made at the Purdue Union Club, Fowler, Cedar Crest and Morris Bryant Hotels.

Acrysol ASE-75

Acrysol ASE-75, a high-solids acrylic thickener and dispersant for aqueous systems reportedly offers reduced shipping costs and simplified handling by conversion to a dilute, viscous salt at the point of use.

Developed by Rohm & Haas Co, Philadelphia, the new emulsion is supplied as a dispersion of forty percent solids and low pH. It reportedly converts instantly to a clear, viscous solution upon dilution and the addition of a base. The advantage of high solids at low viscosity is combined with many of the versatile properties of acrylic water-soluble polymers.

Typical physical properties of the new emulsion are:

Solids	40.0 (plus/minus 0.5%)
pH, when packed	3.0 approximately
Viscosity, Brookfield, 25 degrees C.	20cps
Specific Gravity, 25 degrees C.	1.08
Appearance	milky liquid
Colloidal Charge	anionic

Acrysol ASE-75, as the sodium, potassium or ammonium salt, is a highly efficient thickening agent for natural and synthetic latex compounds, adhesives and other aqueous suspensions. The polymer is said to resist putrefaction and provide viscosity stability on aging over long periods of time.

Salts of the new type thickener will also have application as dispersant and suspending agents for pigments, and as thickeners for paper coatings and textile backings.

Scotchgard Oil-Repellent Textile Treatment

"A textile treatment which will make fabrics resist oil-borne stains" was announced recently by Minnesota Mining and Manufacturing Co (3M), St Paul, Minn.

Known as the "Scotchgard" brand oil-repellent textile treatment, one of the firm's new fluoro-chemical developments, the treatment, which will also resist water-borne and combination stains, can be applied to men's suiting, slacks, sportwear, and topcoating fabrics, including wool and worsted flannels, tropicals, gabardines, sheens, and other worsted and worsted-synthetic blends, as well as upholstering fabrics, according to 3M.

The firm asserted that its treatment is the first in the history of the textile industry that will make fabrics resistant to all stains of salad dressings, gravies, lubricating oils, cooking greases, ink, soda pop, coffee, ice cream, milk, and other oil-borne and water-borne stains.

It said the treatment does two things:

** It makes the fabric oil-repellent and water-repellent—difficult to stain with spilled liquids.*

** In the event that a slight soiling of the fabric does occur, it is very easy to remove with the ordinary solvent spot-remover—without leaving a ring.*

It has no visible effect upon the appearance of the fabric, and in most cases actually enhances the fabric's "feel" or "hand," the company said.

Oil-repellency in practice. On fabric protected by 3M's new "Scotchgard" brand oil-repellent textile treatment, drops of oil stand on the surface and do not penetrate. The treatment has no visible effect upon the fabric's appearance or feel.

It added that the "Scotchgard" treatment can be applied to many wool, worsted, worsted-synthetic, and synthetic fabrics, and as only minute quantities need be applied, the weight of a man's garment is not noticeably increased.

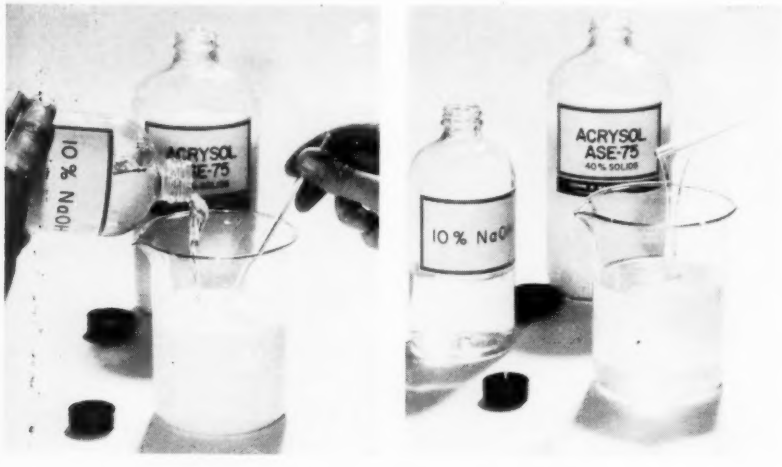
Application takes place during the fabric-finishing process in either one or two additional steps, depending on the method used, and without additional equipment, the 3M company said. It stressed that ease of application means that cost increases are minimized.

The firm explained that the effect of the "Scotchgard" fluoro-chemical treatment is to make the fibers of the treated fabric resist "wicking"—soaking up liquids. Oil, water, and fluorochemicals won't mix—as a result, staining fluids stand on the surface of the treated fabric. Pressed between the fibers, they still do not soak in and can be easily removed with spot-remover. Water-borne stains can simply be wiped off with a damp cloth.

Unlike many fabric treatments, the "Scotchgard" fluoro-chemical is not readily removed by drycleaning, according to its maker. The average fabric can be commercially cleaned at least five times and still retain oil-repellency.

Further, it was emphasized that the treatment has no adverse effect upon the wearer's skin.

The company said that the first fabrics with the "Scotchgard" treatment will be in men's apparel and upholstering materials and will be available to the public after the turn of the year.



ACRYSOL ASE-75 acrylic emulsion is shipped as milky, water-thin liquid of 40 percent solids. Dilution to desired solids and neutralization with base of user's choice (left) gives conversion to a clear, viscous, low-solids solution (right) which is said to be highly efficient as a thickener, binder and suspending agent.

Keystone 5P Lubricants

A new line of acid and alkali-resistant greases for problem applications in the textile, dyeing, and other industries has been announced by Keystone Lubricating Co, 3100 North 21st St, Philadelphia 32, Pa.

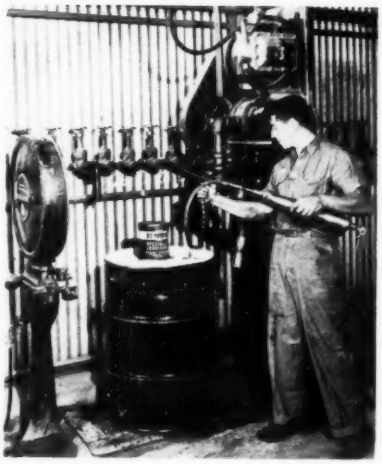
Known as the Keystone 5P line, these specialized lubricants are said to provide effective protection against more than 100 corrosive agents and solvents. In addition, they reportedly prevent leakage, preserve packings, protect equipment and floors, and lower operating and maintenance costs. Savings as high as 50 percent in comparison with conventional general-purpose lubricants are claimed.

The line consists of three types (5P7, 5P8, 5P9) covering a wide range of operating temperatures (from 0 to 350° F). They have a smooth, nonfibrous body, are pale amber to light cream in color, are made in four consistencies (Heavy, Medium, Light and X-Light) and have an ASTM penetration range of from 200 to 350.

These specialized greases are claimed to provide superior lubrication to plain and antifriction bearings, driving chains, pump packing glands, and lubricated plug valves in equipment such as can-closing machines, extractors, pumps, vulcanizers, conveyors, in-take water screens, degreasing machines and other industrial equipment.

They are said to lengthen equipment life by resisting corrosion, cut manufacturing costs by preventing loss of expensive materials, and reduce maintenance expenses by outlasting conventional lubricants.

The Keystone 5P line is available from 275 distributors, coast to coast and in Canada, in 1-lb and 7-lb cans, 25-lb pails, 100-lb kegs and 400-lb drums. Cases contain twelve 1-lb cans or six 7-lb cans.



Moving parts of general industrial equipment such as pumps, valves, conveyors, drive chains, etc are protected from frictional wear and acid and alkali attack by Keystone 5P lubricants. Typical application (photograph) is the lubrication of this rotary transfer pump with Keystone 5P7 Medium.

Bradsyn Softener

A new polyethylene textile softener has been introduced by the Original Bradford Soap Works, Inc, West Warwick, RI. It has been designed to be used in textile finishing operations where extremely good interfiber lubrication is desired. It reportedly gives a pleasing hand to cotton and synthetic fibers.

Bradsyn Softener PE is nonionic and thus may be used either alone or as an ingredient in resin finishing baths or applied as a top softening finish after resin treatment. It is said to be equally effective when used alone as a top softening finish on goods not resin or similarly treated.

Bradsyn Softener PE is readily dispersable in cool water, making for ease of formula preparation and application.

This softener reportedly has excellent resistance to scorching, yellowing and water spotting. It is necessary to use only 1 to 3% to show substantially improved sewability, resistance to needle cutting, tearing, abrasion and crease recovery, it is claimed. It is said to impart outstanding permanency.

Nalcamine

Nalcamine is the trade name of a group of imidazolines—cyclic tertiary amines of high molecular weight—now being marketed by National Aluminate Corporation, 6216 W 66th Pl, Chicago 38, Ill.

Nalco manufacture of tertiary amines is not a new venture, but production has previously been absorbed for use in several of the company's specialized chemical products. New production facilities, and development of new manufacturing techniques, now enable sale of the chemicals to other users.

Imidazolines (glyoxalidines) have been called "all-purpose" chemicals because of the extremely wide range of uses their characteristics make possible. Reacting on an equimolar basis to form cationic surface-active salts, they are used as emulsifiers, demulsifiers, dispersants, wetting agents, plasticizers, water repellents, antistatic agents, corrosion inhibitors, and solvent penetrants. Salts, soluble in either water or oil systems—or a balance between—are said to be practical and commercially feasible with Nalcamines.

EMKAPON TS
(Emkay)

A new type amine sulfonate detergent in "triple strength". Emkapon TS has been designed to be used as an all-around dispersant, scouring assistant, and dyeing penetrant. It is stated that it is a bright liquid, easy to handle and efficient and economical in use.

General Calendar

AMERICAN OIL CHEMISTS SOCIETY
Spring, 1957 (Spring meeting, New Orleans); Sept 30-Oct 2, 1957 (Fall meeting, Cincinnati); Apr 21-23, 1958 (Memphis); Oct 20-22, 1958 (Chicago); Spring, 1959 (New Orleans); Fall, 1959 (Los Angeles).

AMERICAN MATERIAL HANDLING SOCIETY
Apr 29-May 3 (7th Materials Handling Exposition, Convention Hall, Philadelphia, Pa)

AMERICAN SOCIETY FOR QUALITY CONTROL
Feb 25-27—7th Annual Conference of the Textile Division, Georgia Tech, Atlanta, Ga.

THE DRYSALTERS CLUB OF NEW ENGLAND
Jan 21 (Hotel Somerset, Boston); Apr 26 (Hotel Vendome, Boston); June 21 (Annual Outing—Wachusett Country Club, West Boylston, Mass).

THE FIBER SOCIETY
Spring Meeting—May 1-2, 1957, The Clemson House, Clemson S C; Sept 4-6 (Joint meeting with the Textile Institute—Hotel Statler, Boston, Mass)

NATIONAL ASSOCIATION OF HOSIERY MANUFACTURERS
NATIONAL KNITTED OUTERWEAR ASSOCIATION
UNDERWEAR INSTITUTE
April 29-May 3 (1957 Knitting Arts Exhibition, Atlantic City, NJ)

NATIONAL COTTON COUNCIL OF AMERICA
Feb 28-Mar 1 (Cotton Research Clinic, General Oglethorpe Hotel, Savannah, Ga). October 2-3 (Chemical Finishing Conference—Statler Hotel, Washington, DC)

PHI PSI FRATERNITY
April 25-27—Annual meeting, New Bedford Hotel, New Bedford, Mass.

PHILADELPHIA TEXTILE INSTITUTE ALUMNI ASSOCIATION
March 1 (56th Annual Banquet, Bellevue-Stratford Hotel, Philadelphia, Pa)

PURDUE UNIVERSITY
May 13-15 (12th Purdue Industrial Waste Conference, Purdue Univ, Lafayette, Ind)

SCALAMANDRE MUSEUM OF TEXTILES
Jan-Mar, 1957 (Exhibit—"Two Hundred Years of Textile Designs"

TEXTILE QUALITY CONTROL ASSOCIATION
March 28-29 (Spring Meeting, Clemson House, Clemson, SC)

• NAMES IN THE NEWS •

R Wolcott Hooker, senior vice-president of Hooker Electrochemical Co, Niagara Falls, NY, was reelected president of the Synthetic Organic Chemical Manufacturers Association at its 35th annual meeting, held at the Biltmore Hotel, New York, on Dec 3rd. The association represents manufacturers of 90% of the domestic production of commercially marketed synthetic organic chemicals.

John H Hilldring, president of General Aniline and Film Corp, was reelected first vice-president of the association, and **Frederick Dehls,** executive vice-president of Benzol Products Co, was reelected second vice-president.

C K Egeler, Eastern sales manager, Pigment, Color and Chemical Division, Sherwin-Williams Company, was elected treasurer of the association for 1957, while **N C Babcock,** vice-president, Carbide and Carbon Chemicals Company, and **J W Orelup,** president, Patent Chemicals, Inc, were elected new members of the board of governors.

Elvin H Killheffer and **August Merz,** past presidents of SOCMA were reelected honorary members of the board for one-year terms.

Glenn Theodore Seaborg, Nobel Laureate and director of chemical research, Radiation Laboratory, University of California, Berkeley, has been chosen to receive the 1957 Perkin Medal of the American Section, Society of Chemical Industry. Announcement of this highest award in American industrial chemistry was made recently by **Raymond Stevens,** chairman of the Jury of Award and president of the Cambridge (Mass) chemical consulting firm of Arthur D Little, Inc. Presentation of the medal to Professor Seaborg is scheduled to follow a dinner in his honor to be held at the Waldorf-Astoria, New York, on January 11, 1957.

Edward A Murray, textile consultant of Anderson, S C, will become director of instruction in the School of Textiles at North Carolina State College, effective January 1.

The new staff member will succeed the late **Prof Thomas R Hart,** who died last January 10 after serving on the college faculty for 36 years.

In his new position, Dr Murray will serve as a staff adviser to the dean of textiles, primarily on undergraduate education, and to some extent on graduate-level education.

EXPLORER MEETS NEPAL KING—— King Mahendra of Nepal, the inaccessible Himalayan country bordering Tibet, is presented an elegant diamond wristwatch in Katmandu by Nelson S Knaggs, vice-president of The Hilton-Davis Chemical Co, Cincinnati, who made trip as special representative of Mayor Charles P Taft. Ceremony took place on patio of King's palace. A member of the Explorers Club, Knaggs was one of few foreigners permitted to enter Nepal, a country so craggy it has no roads. Object of his trip was to make a color movie of the land used as the jump-off point for the ascent of Mt Everest. The film was commissioned by the Cincinnati Museum of Natural History, of which Knaggs is a director. The diamond-studded watch was specially designed for the King by Gruen Watch Co.

OBITUARY

JOHN F SHEA

JOHN F SHEA, vice-president in charge of sales for the Becco Chemical Division of Food Machinery and Chemical Corporation, Buffalo, New York, died November 26 at the Roswell Park Memorial Institute, in Buffalo, after a long illness. He was 51.

Mr Shea was born and raised in Fitchburg, Mass, and received his technical education at the Lowell Textile Institute, Lowell, Mass. He joined Becco in 1930, serving first as a field representative and later as manager of the New England territory. He moved to Buffalo in 1953 when he was promoted to sales manager for the company, and in 1955 he was elected vice-president in charge of sales.

Burial was in Newton, Mass, where Mr Shea had made his home for many years.

Paul J Flory, eminent scientist of Cornell University, where he is professor of chemistry and acting chairman of the Department of Chemistry, is currently heading Mellon Institute's investigational activities as executive director of research. Dr Flory joined the organization for a day a week this past fall, will serve half time beginning February, and full time in the summer of 1957.

In this new position of research leadership in Mellon Institute—a post that has been established since the recent retirement of **Edward R Weidlein** as president—Dr Flory is principally responsible for mapping and guiding the investigational future of the Institute.

Members of The National Federation of Textiles, Inc elected six directors to serve for three years at their 83rd Annual Meeting held in the association headquarters, 389 Fifth Ave, New York, on December 14th.

The directors are: **John P Holmes,** vice-president, Celanese Corp of America; **Edward P Ix,** president, Frank Ix & Sons, Inc; **Reuben Kittenplan,** president, Chopak-Kittenplan Corp; **Robert M Schwarzenbach,** president, Schwarzenbach Huber Co; **Jackson E Spears,** Burlington Industries, Inc; **Jacques Weber,** president, Bloomsburg Mills, Inc.

Carl M Conrad of the Southern Regional Research Laboratory of the United States Agricultural Research Service, New Orleans, has been elected chairman of the American Chemical Society's Division of Cellulose Chemistry for 1957. Dr Conrad, who is head of the laboratory's cotton fiber section, succeeds **Reid L Mitchell** of Rayonier, Inc, Shelton, Wash.

Leo B Gunung, laboratory supervisor of the Eastman Kodak Company, Rochester, N Y, was chosen chairman-elect and **George C Daul** of Courtaulds, Inc, Mobile, Ala, was named secretary-treasurer.

The 1956 Southern Chemist Award, given annually in recognition and honor of distinguished service to the profession of chemistry in the South, was presented to **C Harold Fisher,** chief, Southern Utilization Research Branch, U S Department of Agriculture of New Orleans, La, at the banquet of the Southeastern Regional meeting of the American Chemical Society on December 7, at the Peabody Hotel, Memphis, Tenn.

C Scott **Althouse** has been elected chairman of the board of Althouse Chemical Company, Reading, Pa, a division of Crompton and Knowles Corp. Dr Althouse has been president of Althouse since its founding in 1917.

Dr Althouse will be succeeded as president by **Howard F Bjork**, effective January 1st. Mr Bjork was previously president of Index Chemical Company, a subsidiary of Pennsylvania Salt Manufacturing Company, and also director of manufacturing for the Sharples Chemical Company, a division of Pennsylvania Salt. Mr Bjork has been associated with Sharples since 1937 serving in various management capacities and was elected vice president in 1954.

The board of directors of Acoustica Associates, Inc, Glenwood Landing, N Y, has announced the election of **Paul M Platzman** as vice president of sales and manufacturing. The firm, a manufacturer of ultrasonic equipment, instruments and processing systems, also announced the appointments of **Harold P Baker** to the position of vice president and treasurer, and **Ralph Reynolds** as technical sales manager.

Mr Platzman was formerly manager of the Public Relations Department, John Mather Lupton Co, Inc.

Mr Baker is a certified public accountant most recently associated with Arthur Young & Company.

Mr Reynolds was formerly connected with the Kelite Corporation, engaged in technical service and sales of metal processing chemicals.

James A Forrest and **Thomas J Hetherman** have been named senior salesmen for the Michigan Alkali Division of Wyandotte Chemicals Corp.

Mr Forrest, formerly a salesman for Iselin-Jefferson Co, Inc, will operate out of the Company's Eastern District Office in New York. His territory will be upstate New York.

Mr Hetherman will headquarter in the Company's Chicago office and serve the states of Iowa, Minnesota, and the Dakotas.

As previously noted, **Louis C Goode** has been named plant manager of the Moundsville, W Va, plant of National Aniline Division, Allied Chemical & Dye Corp, succeeding the late **Ross M Sims**. He will be in charge of all National Aniline activities at Moundsville, including its new production facilities for isocyanates.

Prior to his Moundsville appointment, Mr Goode was supervisor of the Azoics Division of the company's Buffalo Plant since 1943.

Althouse

Stein

Bjork

Stevens

Platzman

Morgens

Forrest

Beller

Hetherman

Woolfenden

Goode

Fisher

Edwin Stein, chairman of the board of Stein, Hall & Co, Inc, was honored on December 12th at a testimonial dinner in celebration of his 40th anniversary of service with the Company. The special ceremony, attended by more than 60 representatives of Stein Hall and its subsidiaries, was held at the Jansen Suite of the Waldorf Astoria Hotel in New York City.

The program featured a brief congratulatory talk by **Lawrence Gussman**, president of Stein Hall. **Arthur L Strasser**, a director of the Company, acted as toastmaster. A set of eight commemorative china plates inscribed with the signature of each of the directors of the Company was presented to Mr Stein.

Robert T Stevens, president of J P Stevens & Co, Inc, and **Howard J Morgens**, executive vice president of The Procter & Gamble Co, were elected recently to the board of Owens-Corning Fiberglas Corporation.

The new directors were chosen to fill vacancies created when the corporation's by-laws were amended to increase board membership from six to eight.

Lester B Woolfenden has been named plant manager of the acetylene chemical products plant of General Aniline & Film Corporation at Calvert City, Ky.

Hans Beller, who supervised construction and start-up operations of the Calvert City plant to its present "on stream" operation in the capacity of plant manager, will return to his position as acetylene projects director for the Division.

Mr Woolfenden joined General Aniline at the Company's Linden, N J, plant in January 1929 and for the past eleven years has been plant engineer there.

Dr Beller will continue the further development of the acetylene program and other expansion programs planned by the Company.

Roy S Fisher was elected vice-president and named director of sales for National Vulcanized Fibre Co, Wilmington, Del, at the company's October 26th board of directors meeting. In this new capacity, he will direct the sales of all National's industrial and consumer products to both domestic and overseas markets.

Before being appointed manager of sales in 1955, he was manager of National's Cleveland-Pittsburgh-Cincinnati territory for 24 years.

Henry A Weil has been appointed associate director of the New York Application Research Laboratories of Sandoz Chemical Works, Inc. Mr Weil will supervise the subdivision of the laboratory which works on application of Sandoz dyes to new fibers, mill processes, and development of desirable dyeing methods and procedures.

Mr Weil comes to Sandoz from Chemstrand Corp where he was in technical sales service for two years.

His experience with dyestuffs and fabrics includes four years as a textile engineer with General Motors Corp, and twelve years with the National Aniline Division of Allied Chemical & Dye Corp.

Morris B Minkin and **Richard S Ploss** have joined the staff of the International Salt Company's main research laboratory in New York. Mr Minkin is a chemical engineer and Mr Ploss a chemist.

Mr Minkin joins International Salt after five years with the Army Chemical Center, Edgewood, Md, where he supervised a group of chemists, engineers and technicians.

Mr Ploss was assistant research director of the Gas Purifying Materials Co, New York, before joining International Salt.

The United States Testing Company has appointed **Ralph M Ennis** senior psychologist in the Psychometrics Department of the Company's laboratories in Hoboken, N J.

Before joining U S Testing, Dr Ennis was a teacher of psychology and education at Hunter College.

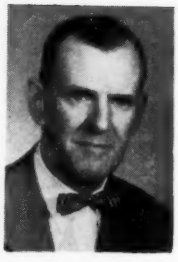
Robert C Bokum, formerly director of the Evening School at Philadelphia Textile Institute, is now serving as acting head of the Institute's new business course.

Additional faculty moves at PTI include the advancement of **Richard Landry** (to assistant professor of chemistry and dyeing), **George J Gradel** and **William Wolfgang** (to assistant professors of chemistry), and the appointments of **Ward H Smith** and **Jean H Green.** Mr Smith has been named an instructor in the Chemistry Department, and Mrs Green will serve on a part-time basis as a special lecturer on color.

Peter M Perceval has joined the Public Relations Department of the Chemstrand Corporation.

Perceval comes to Chemstrand from Pensacola, Fla, where he was production manager for the Pensacola Engraving and Printing Company.

Weil



Baxter

Minkin

Stroud

Ploss

Hou

Ennis

Slaght

Appointment of **Emil Alter** as head of its Natural Gums Laboratory at Long Island City, N Y, was announced last month by Stein, Hall & Co, Inc. Mr Alter, who has been concerned with development work in natural gums for many years now, replaces **Arthur Goldstein,** recently named chief chemist of the firm's Paper Laboratory.

Werner L Riegler has been appointed product manager of the fatty acid sales department of the Chemical Division of Armour and Company.

Mr Riegler, formerly assistant manager of fatty acid sales, started with Armour in 1951 in the application research department.

Edward J Baxter has joined Dexter Chemical Corp, New York, N Y, as technical sales representative for textile chemicals in Virginia and North Carolina.

Mr Baxter, before entering sales work with the E F Drew Co, had 32 years of textile mill experience in New England and the south.

Coy F Stroud has been named manager of the southern sales division for The Goodyear Tire & Rubber Company. Stroud's headquarters are at Atlanta, Ga.

He succeeds the late **L H Shepherd,** for whom he served as acting division manager during the latter's extended illness.

Associated with the Goodyear sales organization for more than 30 years, Stroud held district managerships at Cincinnati, Columbus and Charlotte prior to his present appointment.

Metro-Atlantic, Inc, Centredale, R I, has announced the appointment of **George N Houth** as a sales representative in the New England territory.

Emkay Chemical Co, Elizabeth, N J, has named **E L Rodgers** to handle technical sales in Georgia and Alabama.

E C Slaght, Jr, has been appointed manager of the market development department of Heyden Chemical Corporation.

Mr Slaght was previously supervisor of special products in the market development department.

Appointment of **Thornton F Holder** to the post of director of research for Diamond Alkali Company, Cleveland, Ohio, has been announced.

Holder replaces **Albert W Meyer,** who has resigned from his present position as director of exploratory research. Dr Meyer plans to continue in the field of chemical research. He will announce his plans in the near future.

Diamond's new research director joined the Company in 1946 as patent counsel, and eight years later was named research coordinator and patent counsel.

Emelie Tolley has been appointed fabric coordinator of Celanese Corporation of America's Textile Division.

Miss Tolley has been assistant fabric coordinator for the year she has been with Celanese. Previously she was associated with *Glamour* and *McCall's Pattern Book.*

Kenneth G Ellsworth has been named director of public relations of the American Standards Association.

Mr Ellsworth comes to ASA from the American Thread Company, where he was manager of public relations. He also served in the public relations field with Johns-Manville Corporation and with the National Broadcasting Company.

He succeeds **George P Paine,** former public relations director and assistant secretary of the Association, who was recently appointed executive secretary-assistant treasurer of the American Association of Textile Chemists and Colorists.

Riegel Textile Corporation has announced the election of **N Barnard Murphy** as vice president for administration, and of **William F Robertson** as vice president for textile production. Administrative functions in all manufacturing divisions will now be under the supervision of Mr Murphy, who was formerly vice president and general manager of the company's Trion Division. Mr Robertson, formerly vice president and general manager of the Ware Shoals Division, will now be in charge of all manufacturing facilities at the Johnston, Trion and Ware Shoals Divisions.

Preston H David will assume Mr Murphy's duties as general manager of Trion Division, and **Ralph P Hardeman** will assume Mr Robertson's duties as general manager of Ware Shoals.

Harry A Turner has been advanced to assistant general manager at Ware Shoals, and **Clyde C Cobb** to the same position at Trion.

Henry F Dever, president of Brown Instruments Division of Minneapolis-Honeywell, has been given corporate responsibility for directing the parent company's activities in the industrial controls field.

Dever will be responsible for the over-all planning in the industrial controls field and will counsel and coordinate the engineering and manufacturing operations of seven M-H divisions now active in this field. He will continue to head up the Brown Instruments Division (Philadelphia) and will make his headquarters there. **C L Peterson,** vice president and general manager of the division, will direct its daily operations.

Dever, a 30-year man with Honeywell, was vice president in charge of engineering in Minneapolis before moving to Philadelphia to head up the Brown division. He is also president of the Scientific Apparatus Makers Association.

J B Dickey, associate director of research, Tennessee Eastman Corp, Kingsport, Tenn, visited the Southern Utilization Research Branch of the Agricultural Research Service, USDA, in New Orleans, La, recently, to discuss research on cotton, particularly in relation to new developments in the chemical modification of this product. While at SURB he gave a seminar on the effect of Sir William Henry Perkin's work on the dye and chemical industry, and traced the dye industry from the natural dyes to the present high development of chemical dyeing. Pictured left to right are W G Bickford of the Oilseed Section, SURB, Dr Dickey and C M Conrad of the Cotton Fiber Section, SURB.

Edward R Schwarz, professor of textile technology at MIT, **Edmund Rigby,** vice president of Berkshire-Hathaway Co, and **H S Lamprey,** vice president of the Union National Bank of Lowell, Mass, were awarded honorary membership in the Delta Kappa Phi Fraternity of America, Inc, at a banquet held last month at the MIT Faculty Club for the professional textile fraternity's members in the New England area.

The group was addressed by **Walter J Hamburger,** director, Fabric Research Laboratories, Inc, and **John E Foster,** dean of the New Bedford Institute of Textiles and Technology, served as master of ceremonies. Professors **Louis E F Fenaux** and **Ray E Macausland,** faculty advisers for the NBITT and Lowell Technological Institute chapters, conducted the initiation ceremonies.

Reorganization of the sales force of the Silicone Products Department of General Electric Company and the creation of two new sales districts has been announced.

The new district managers are **Milton C Lauenstein,** heading the Chicago Sales District and **Robert T Daily,** heading the Western Sales District with headquarters at Los Angeles.

The original district offices at Cleveland and Newark will be continued. Except for increases in manpower, no changes have been made in sales offices for salesmen and materials engineers in Boston, New Haven, Philadelphia, Charlotte, Detroit, Dallas and at department headquarters at Waterford, N Y.

Carbide and Carbon Chemicals Co, a Division of Union Carbide and Carbon Corp, has announced the following appointments:

W C Heidenreich, superintendent of the Niagara Falls plant, has been named associate director of the General Industrial Relations Department. **H B Coons,** formerly of the South Charleston plant, will assume Mr Heidenreich's duties at Niagara Falls.

R P Barry, Jr has been named superintendent of the Chemicals and Plastics Resins Plant at Seadrift, Texas, succeeding **C M Blair,** who is being assigned to the New York headquarters of the Company.

J R Howell, R W Lindberg and **Julian Paul** have been named assistant district sales managers in the Chicago, Cleveland, and Boston Districts respectively.

Four technical representatives, after completing their training in the General Sales Office in New York, have been assigned to district offices of Carbide and Carbon Chemicals Company.

The assignments are: **J A Buser** to the New York District; **A A Jackson** to the Atlanta District; **R C McQueen** to the Kansas City District; and **C D Schmidt** to the Chicago District.

Thomas G Fox, head of the polymers research labortaory of the Rohm and Haas Co, Philadelphia, has been elected chairman of the American Chemical Society's Division of Polymer Chemistry for 1957.

Dr Fox succeeds **Raymond F Boyer** of the Dow Chemical Company, Midland, Mich.

Parker

Masland

Ruddock

Lermond

DeLargey

Allen

Samuel I Parker, Congressional Medal of Honor winner, veteran of World Wars I and II and vice-president of Ciba Co, Inc, retired on November 1st after 25 years with Ciba. He and Mrs Parker expect soon to move from their home in South Orange, N J, to live on a farm near Concord, N C, their native State. Plans include his being retained, however, on a consulting basis with Ciba.

Between the two wars Mr Parker took a special course in textiles at the University of Manchester, England, and then worked for several years in textile mills in the southern United States. He joined Ciba in June, 1931, as a representative and was assigned to travel in several Southeastern states. In 1937 he was called to New York to become national sales manager for the Company, and in 1946 he was made vice-president. In his quarter century with Ciba, he helped to introduce many of the company's developments to the textile trade. Highly respected in every textile area, he counts many close friends in the industry.

Frank E Masland, Jr, president, C H Masland & Sons, Carlisle, Pa, will be the principal speaker at the 56th Annual Banquet of the Philadelphia Textile Institute Alumni Association, to be held Friday evening, March 1, at the Bellevue-Stratford Hotel, Philadelphia.

Members of the Banquet Committee of the PTI Alumni Association for this year include: **Charles P Hoffner,** chairman, Hoffner Rayon Co; **Richard W Foltz,** Globe Dye Works Co; **Howard P Galloway,** Galloway Publishing Co; **Paul J Gebert,** Alumni Executive Secretary, PTI; **Frank Giese,** Faculty PTI; **Selma Crane,** Alumni Staff, PTI; **Richard S Lembeck,** Fabrex Corp; **G J Littlewood, 3rd,** G J Littlewood & Sons; **John J McLaughlin,** E F Houghton Co; **Stuart McConaghy** and **James S Moran,** E I du Pont de Nemours & Co, Inc; **Dominick A Siravo,** Hess, Goldsmith Co; and **Peter J Osborne,** R C Osborne Co.

The Dow Chemical Company has announced appointment of a merchandising executive as sales manager of its recently formed Textile Fibers Department. He is **Amos L Ruddock,** head of the merchandising section of Dow Plastics Sales for the past 10 years.

In his new post, Ruddock will supervise sales, market research, distribution, customer service and merchandising in connection with the company's new textile fiber, Zefran.

Dow plans a fiber research, manufacturing and marketing center near Lee Hall, Va. The operation is headed by **Arthur E Young.**

Ruddock succeeds **G J Williams,** who was named to the newly created position of assistant to the sales manager of the Plastics Department at Dow's Midland, Michigan, headquarters.

Fabric Research Laboratories, Inc, Dedham, Mass, has promoted **Charles A Lermond** to the position of senior research associate. He has been engaged in research and development for FRL since 1953.

FRL's **Walter J Hamburger** and **William G Klein** served as speakers at two important textile seminars this month.

Dr Hamburger, director and treasurer, spoke at the December 10th meeting of the Textile Technology Seminar at Massachusetts Institute of Technology, sponsored by the Textile Division of MIT. The speech was a repeat of the 29th Annual Edgar Marburg Lecture, originally given by Dr Hamburger in June, 1955.

Mr Klein, senior research associate at FRL served as speaker at the December 13 Seminar of the Textile Research Institute. His subject was, "Some Changes in Fabric Structure Under Biaxial Stresses."

Milton M Platt, vice president and associate director of FRL has been appointed a member of the Committee on Textile Fabrics of the National Academy of Sciences-National Research Council, Advisory Board on Quartermaster Research and Devolopment.

Robert J DeLargey, resident manager of Food Machinery & Chemical Corp's Westvaco Chlor-Alkali plant at South Charleston, W Va, has been promoted to the post of director of engineering for FMC's Chemical Divisions.

In FMC's newly formed Organic Chemicals Division, **Sherman K Reed** has been named assistant to the president of the Division with responsibilities in research, and **Leonard Seglin** has been named manager of engineering development.

Dr Reed, who was formerly assistant director of the research department of FMC's Niagara Chemical Division at Middleport, NY, will now be located at Organic Chemicals Division headquarters in New York.

Mr Seglin, formerly supervisor of processing for the combined FMC Chemical Divisions group, will also headquarter in New York.

American Cyanamid Co recently announced the appointment of **Eugene Allen** as a group leader in the Dyes Research Section of the Bound Brook Laboratories.

A research chemist with Cyanamid since 1945, Dr Allen will supervise a group which is primarily concerned with dye application research and the preliminary evaluation of new products in this field.

* * * * *

Within Cyanamid's newly formed Fibers Division, **Clare W Bendigo** has been named technical director, **William L Lyall, Jr,** sales manager, and **N H Marsh,** manager of the fiber plant soon to be constructed in Santa Rosa County near Milton, Fla, to produce the Company's new acrylic fiber, Creslan.

Mr Bendigo has headed fiber market development activities at Cyanamid since 1951; Mr Lyall came to Cyanamid from Bates Fabrics, Inc, where he was executive vice president; and Dr Marsh had been manager of the Synthetic Fibers Research Section at Cyanamid's Stamford, Conn, Laboratories since 1954.

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ABSTRACTED

OFFICIAL PUBLICATION
PROCEEDINGS
AMERICAN
ASSOCIATION
OF
TEXTILE
CHEMISTS
AND
COLORISTS

AMERICAN
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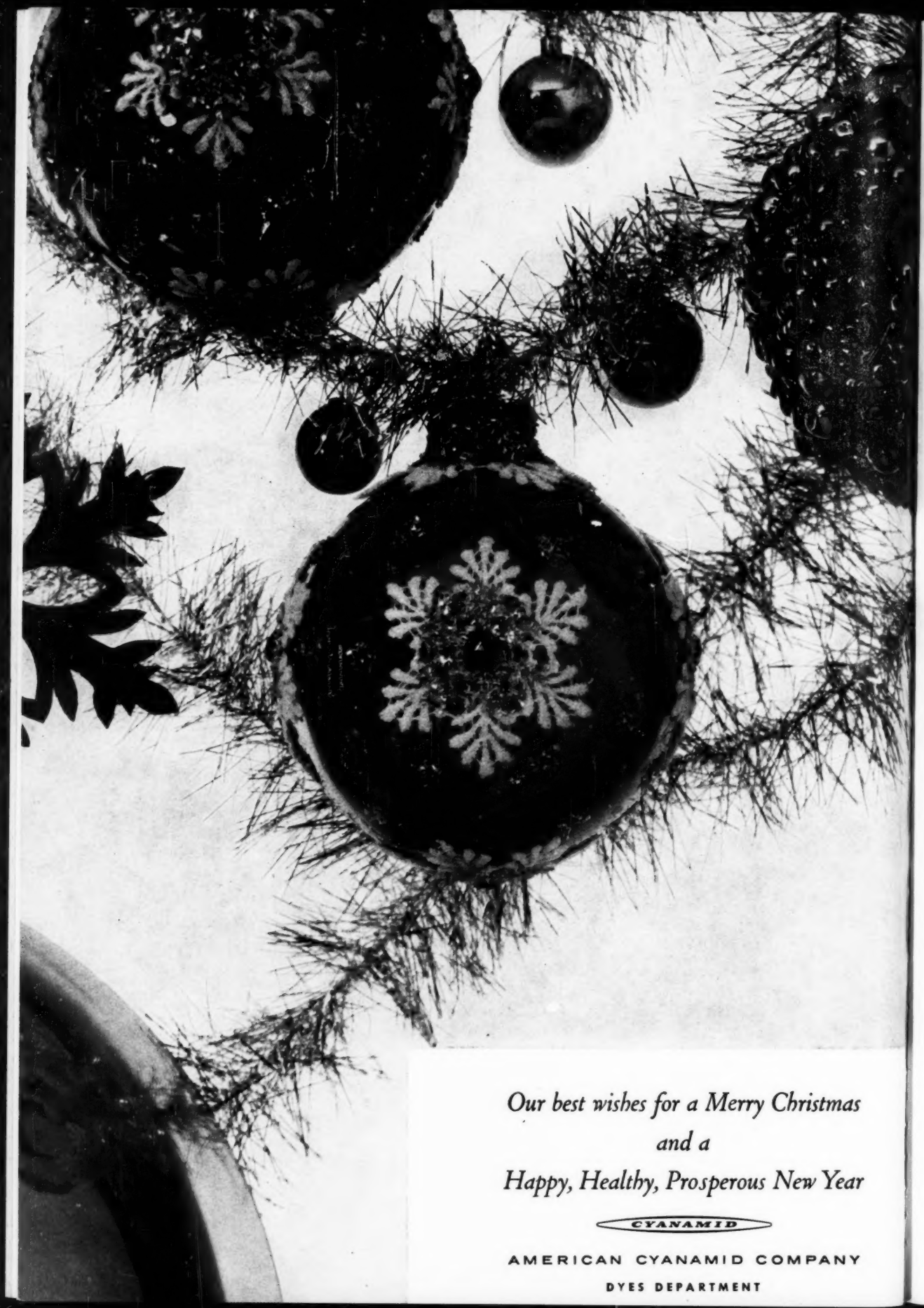

Our best wishes for a Merry Christmas
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AMERICAN
DYESTUFF REPORTER

Volume 45
January, 1956-December, 1956

Including the
Index to
PROCEEDINGS OF THE
AMERICAN ASSOCIATION OF
TEXTILE CHEMISTS AND COLORISTS

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